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**CRITICAL SUCCESS AND MODERATING FACTORS EFFECT IN INDONESIAN
PUBLIC UNIVERSITIES' BUSINESS INCUBATORS**

ABSTRACT

This study aims to examine the effect of critical success and moderating factors in Indonesian public universities' business incubators. The study of business incubators benefits university professors in their roles as managers and advisors, university faculty entrepreneurs and start-ups/tenants in the knowledge transfer and entrepreneurship learning processes, ~~as well as and~~ government officials in effective policy making. For the universities, the incubators serve as a platform for ~~the commercialisation~~ commercialization of their research efforts. The incubators assist the universities' stakeholders in fulfilling their newly identified responsibilities towards building the nation's economy and giving the faculty members and graduate students the chance to conduct research. ~~For~~ Regarding the economic environment, the incubators help ~~to~~ create job opportunities, increase the country's economic value, and reduce poverty. This research employed the quantitative method approach, and the data were ~~analysed~~ analyzed using the IBM SPSS version 23 and Smart PLS version 3 statistical software packages. The samples of this research ~~were~~ comprised of 31 business incubator managers from Indonesian public universities. ~~There~~ Although there have been previous models about critical success and moderating factors for business incubators in other countries, ~~and~~ this study is the first study that was conducted in Indonesia ~~that and~~ found direct and indirect relationships between critical success factors and moderating success factors for Indonesian Public University Business Incubators. The results of the research demonstrated that good system and infrastructure show a strong direct relationship with success factors ~~and~~ that information technology shows a strong relationship with the moderating factors, ~~namely:~~ namely: age and quality of facilities. ~~Furthermore,~~ mentoring and networking showed a strong relationship with the moderating factors good system and infrastructure ~~and that~~ university regulation had a strong relationship with moderating factor credit and rewards. Entry criteria, exit criteria, and funding support showed strong direct relationships to success factors. ~~These~~ findings could improve the management of business incubators in Indonesian Public Universities ~~and allow them to in order to be~~ more successful.

Keywords: Critical Success Factors; Moderating Factors; University Business Incubators; Indonesian Public Universities

1. INTRODUCTION

While the term "entrepreneurship" ~~represents~~ has various meanings, it ~~could~~ can be defined as "the process of uncovering or developing an opportunity to create value through innovation" (Kaufmann Center, Macke and Kayne, 2001). According to Feldman (2016), research on university faculty, staff and entrepreneurial capacities ~~may~~ can be extended and investigated in various areas of study. In the long run, business enterprises are crucial elements ~~for in~~ determining economic success (Romer, 1994). In addition, during economic recessions, new firms play a crucial role in providing employment, proliferating inventions, and driving ~~the~~ a country's economy (Dana, 2004; Engle et al., 2010; Ahmed et al., 2010).

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Researchers, policymakers, operators of business incubators, and stakeholders do not have an adequate and proper method to monitor and appraise business incubators' performances in various business sectors and diverse geographical areas. Previous studies ~~have been lacking in lack the~~ theories, methodologies, and empirical data to appraise business incubators' performance and their impact on the economy, ~~even though they are of particular interest to despite gaining substantial interest from~~ academicians and industry practitioners alike (Lewis, 2001; Cornelius and Bhabra-Remedios, 2003). ~~Therefore, business~~ Therefore, business incubators are expected to define their own performance measurements (Voisey, 2006).

According to the National Business Incubation Association (NBIA) (2003), an important factor in the appraisal of ~~an incubator's~~ performance is the service provision method, ~~and yet, but~~ it has not been given enough attention. There is a lack of research ~~as about~~ how the services have been extended to the incubators. The incubators ~~goal is are interested~~ to discover whether the services are provided by their managers, boards, or mentors, or through internal courses or other ~~ways~~ methods.

The failure rate in the early stage of start-ups is 90% (Patel, 2015; Griffith, 2017). Data on the rates of business failures are frequently quoted (NBIA, 2003). According to the U.S. Small Business Administration, only 44% of firms stay in business four years after ~~the~~ commencement of operation. This is contradictory to the data gathered by the NBIA, which ~~is reports that~~ 87% of graduate firms remained in business ten years after ~~the~~ commencement of operation. ~~From On account of~~ the data of failed start-ups, ~~it becomes necessary to there is a need to~~ identify the critical success factors of building business incubators for ~~the~~ public universities in Indonesia. ~~Therefore,~~ this study's objective, ~~therefore,~~ is to identify the critical success factors in those incubators. The focus of this study ~~will be is~~ on the activities of Indonesian public universities' business incubators, especially the capabilities and the activities of 31 business incubator managers.

Indonesia's fast growing middle-class market is a fertile ground for start-up enterprises, both local and foreign. This trend presents promising prospects across various industries, including technology, communication, creative and social enterprises, ~~among others~~. Nurturing a resilient business sector will result in the creation of new jobs and more business prospects across industries, ~~which makes it and is therefore~~ critical for ~~the~~ economic ~~development growth in of~~ developing countries (Singtel, 2017).

There is ~~no~~ previous research ~~about that addresses~~ the effect of critical success and moderating factors ~~towards atowards a~~ business incubator's success, especially among Indonesian public university business incubators. The main purpose of this research is to identify the direct and indirect relationships between critical success factors and moderating success factors for Indonesian public university business incubators.

~~A However, a~~ well-known cultural issue, ~~however,~~ is that Indonesians ~~have a low tendency are less likely~~ to initiate their own business ventures. According to a study by the Global Entrepreneurship Monitor, 14.5% of Americans and 7.2% of Singaporeans are keen to start up their own businesses. These statistics stand in stark contrast to ~~only the~~ less than one percent of Indonesians who are willing to do ~~so the same~~ (Frazier, 2012).

2. LITERATURE REVIEW

2.1. University Business Incubators

The clients of the University of Central Florida's Business Incubation Program ~~gain receive huge extensive~~ benefits ~~in terms of regarding~~ business, technology, and entrepreneurship support (O'Neal, 2005). The incubator ~~is emphasised emphasized on as one of the~~ several critical

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success factors that will ensure its a client's success by: (1) incorporating clients into a larger technology development system; (2) encouraging ~~engagements interaction~~ among clients, incubator management and its employees, external parties, and the incubator's advisory panel; and (3) giving access to external financing, university resources, economic development agencies in the local community/government, and other business support ~~organisations organizations~~.

~~Today~~Currently, there is a higher degree of support from the university incubators for small firms in the latter's quest for long-term viability and development that involves networking among the entrepreneurs. Several previous studies have investigated ~~in detail~~ the importance of networking for entrepreneurs ~~in detail, and they emphasize with emphasis on~~ the steps towards developing and maintaining relationships within the business setting (Aldrich & Zimmer, 1986; Shaw & Conway, 2000; Hoang & Antoncic, 2003; Neergaard, 2005). Among the advantages offered by the incubator are networks and cooperation, and many businesses would be keen ~~if presented with the chance~~ to collaborate with the best ~~among of~~ them ~~if they were given the opportunity~~ (Agnete, 2011). Therefore, according to Miller et al. (2011), ~~a lot of more~~ attention ~~should ought to~~ be given ~~towards~~ keeping and preserving knowledge ~~in networks in order to because it would~~ assist in the ~~universities'~~ technology transfer processes, ~~especially on account of the universities because~~ of the fleeting nature of spin out companies evolving through the process.

2.2. Regulation of Business Incubators in Indonesian Universities

~~In order to~~ improve the well-being of the country's citizens, ~~it is necessary for~~ the government ~~needs to~~ tackle a major challenge, ~~which namely is~~ unemployment. The Central Bureau of Statistics (CBS) of Indonesia revealed that ~~in 2017~~, 5.33% of Indonesia's workforce were unemployed and 11.5% of the population were below the poverty line ~~in 2017~~. In support of the government's programme to alleviate poverty, entrepreneurship projects at ~~the~~ public universities are expected to help provide employment, ~~which will also and hence~~, reduce the number of poor people.

~~In September 2017~~, ~~(The Federal Open Market Committee (FOMC) reported stated in its report in September 2017~~ that the normal unemployment rate should be between 4.4% and 5% with a median value of 4.6%. Regrettably, 5.33%, or 7.02 million of Indonesia's population, were unemployed (CBS, 2017). Additionally, 2.07%, or 3.4 million of the country's population, were illiterate (Ministry of Education and Culture, 2017). To make matters worse, uneducated people are often used in demonstrations in Indonesia. These people are in dire need of jobs that can help improve their economic and financial conditions. ~~B-Thus, business incubators, therefore,~~ play an important role ~~because they will in assisting help~~ Indonesia ~~in resolvesolving~~ some of its economic problems ~~through by creating jobs creation~~ and graduated firms.

~~W-The government of Indonesia, with the~~ assistance from the Cooperative Department and universities, ~~the government of Indonesia has had~~ established the incubators in the country since 1992. This initiative was given a boost in 1997 ~~through by~~ a programme known as the Development of Entrepreneurship Culture in Universities, where activities ~~included~~ the New Entrepreneurs' Incubators (Bank Indonesia, 2006).

In addition to ~~the~~ Indonesian regulations about business incubators, the terms of business ~~incubators~~ incubation activity, and incubation participation are governed by the Presidential Regulation number 27/2013, ~~the Development of Entrepreneurial Incubators~~. Further, ~~in the~~ Ministry of Cooperatives and Micro, Small and Medium Enterprises ~~had introduced~~ Regulation No. 24/Per/M.KUKM/IX/2015 on Norms, Standards, Procedures, and Criteria (NSPK) of the

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Management of Entrepreneurial Incubators. This ~~that~~ regulates the administrative matters of an incubator, including registration, required standards, required services, expected output of an incubator and its tenant, and a targeted number of incubators in the country. ~~However, some of the parameters on regarding the regulation, however,~~ are unspecific, such as the employees' standards of professionalism, the provisions of sufficient facilities and infrastructure, and measurements of the incubators' success indicators.

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2.3. Business Incubator Successful Factor Development

Most problems that entrepreneurs encounter ~~in at~~ the early stages of business development are a lack of legitimacy, experience, tangible resources, and accumulated knowledge, which are success factors ~~that allow them~~ to recognize and seize business opportunities. Business incubators do not guarantee graduate tenant company. ~~However, evaluating all of the emerging cCritical sSuccess fFactors, however,~~ can minimize failures once the company enters the business incubator (Lumpkin, 1988).

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The initial framework by Campbell, Kendrick and Samuelson (1985) emerged with the simple business incubator services and facilities. The business incubator framework started with entry criteria, selection processes, funding, and mentoring-networking for tenant business growth.

Smilor (1987) introduced a non-profit business incubator framework whose model implicates the tenant business mission, such as economic development, successful products, a tenant's profit, technology diversification, and job creation. Smilor's framework involved support systems, ~~namely (i.e. administration, facilities, and business expertise, from~~ universities and the government. His ~~extensive work was probably the most extensive instrives to~~ ascertaining and elaborate ~~uponing~~ the different elements of an incubation system. Campbell (1989) introduced ~~the a~~ new incubation process model ~~that consisteding of a~~ pre-incubation process, entry criteria and selection processes ~~and~~ monitoring and controlling processes. The previous models by Campbell et al. (1985) and Smilor (1987) ~~had did~~ not introduced the processes and activities from the pre-incubation and incubation processes until successful outcomes were achieved. Mian (1997) ~~gave provided~~ more detailed processes, criteria, policies, and programmes; and ~~had~~ sought the involvement of universities, communities and other stakeholders ~~in developingfor the development of a~~ theoretical model ~~for theto evaluation~~ and management of the university-based technology business incubators' (UTBI) performance. ~~FMian for the first time, Mian~~ introduced the university involvement and developed performance criteria for technology business incubators in the public and private sectors.

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The business incubator model is ~~categorisedcategorized~~ as pre-incubation activities or input (entry criteria), incubation or process, and graduation or output (exit criteria) (Costa-David, Malan, & Lalkaka, 2002). Costa-David et al. ~~were the first to for the first time gaveoutline~~ the detailed skill requirements, ~~(such as management, finance, business advice, networking and training for start-ups until their graduation)~~. Verma's (2004) framework introduced more detailed success factors, ~~namely (i.e. shared services, facilities and location, financing and support, control of incubators, mentoring-networking, entry criteria and~~ exit criteria), as well as moderating factors, ~~such as (i.e. age and the quality of facilities for a successful business incubator framework)~~. Voisey (2006) introduced the concepts of hard (profitability, sales turnover, etc.) and soft (business skill improvement, cost saving, etc.) performance measurements of business incubator practice achievement.

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3. RESEARCH METHODOLOGY

~~All-Each of~~ the 9 success factors, 3 moderating factors and 115 indicators in this research ~~had beenwas~~ investigated in Gozali et al. (2015). ~~Tand~~ the development of a proposed initial

framework of successful business incubators in Indonesian public universities from previous business incubator's model and framework ~~has was also been~~ explored ~~in by~~ Gozali et al. (2016). The research was addressed using mixed methods, ~~specifically~~ (qualitative and quantitative methods). In the qualitative method, ~~the~~ literature study and expert interviews were conducted in Indonesian public university business incubators to develop the questionnaire. In the quantitative method, data collection, data calculation (reliability and validity), ~~and a~~ calculation of the business incubators' success factors' value were performed. The data were collected from March ~~through to~~ October 2016.

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3.1 Research Location

This research was conducted in Indonesia with the participation of 18 Indonesian public university business incubators, comprising Universitas Sumatera Utara, Universitas Andalas, Universitas Indonesia, Institut Pertanian Bogor, Universitas Diponegoro, Universitas Sam Ratulangi, Universitas Brawijaya, Universitas Airlangga, Institut Teknologi Sepuluh November, Universitas Riau, Universitas Udayana, Universitas Gorontalo, Universitas Sebelas Maret, Universitas Jambi, Universitas Padjajaran, Bandung Techno Park, Universitas Negeri Yogyakarta, and Institut Teknologi Bandung.

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3.2 Research Sample

The sample of this research is comprised of incubator managers in public universities in Indonesia who ~~were in charge of~~ oversaw the daily activities of the incubators and graduated tenant companies. ~~The samples were selected as the managers had the~~ required understanding and experience in incubator management as well as in handling the relationships among tenant companies within the incubators.

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This research saw the participation of 77.4% male and 22.6% female respondents ~~within~~ the age ranges of below 30 years old (3.2%), 30–39 years old (29%), 40–49 years old (19.4%), 50–59 years old (35.5%), and over 60 years old (12.9%). All the respondents were business incubator managers. The respondents' levels of education consisted of Bachelor's degrees (6.5%), Master's degrees (51.6%) and Doctorate degrees (41.9%).

4. DATA ANALYSIS AND RESULTS

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4.1 Indicator Reliability Test

~~This research employed the mixed methods approach.~~ This study employed a mixed-method research design, ~~namely~~ (quantitative and qualitative methods), which ~~uses~~ a sequential explanatory design ~~that begins starting~~ with data collection from a literature review and developing a quantitative study ~~that is~~ supplemented by data from in-depth, one-on-one interviews. The status of the quantitative aspects of the research ~~is was~~ considered higher than the qualitative ~~since because~~ the interviews with the expert were based on empirical data, which was collected first. The quantitative study continued with reliability and validity tests, research hypotheses tests, and a structural model test. ~~The research used the case study as a part of the qualitative method to~~ study examine the differences among public university business incubators in Indonesia.

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~~The data were was~~ analyzed using statistical software IBM SPSS version 23 and Smart PLS version 3. ~~The Cronbach~~ Cronbach alpha values ~~that were~~ calculated are larger than 0.6 (Hair et al., 2012). ~~A~~ Therefore, all of the reflective latent variables, ~~therefore~~, have high levels of internal consistency reliability. Composite reliability ~~that was~~ calculated is larger than 0.7, ~~so~~ which confirms the composite reliability ~~is confirmed~~ (Bagozzi and Yi, 1988).

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MeanwhileFurthermore, convergent validity, such as the ~~a~~Average ~~v~~Variance ~~e~~Extracted (AVE) of the latent variables should exceed the acceptable threshold value of 0.5 (Bagozzi and Yi, 1988). Some indicators ~~showed the an unacceptable reliability test, and they were are~~ removed from the research. The indicators that ~~do did~~ not meet the threshold ~~are were~~ FAC 1 (business taxes), FAC 2 (risk and management unit), FAC 7 (export development assistance), FAC 8 (writing financial report, ratio ~~and~~ balances), SBSE 1 (audio visual equipment), SBSE 10 (office hour answering service), SBSE 11 (air conditioner), SBSE 12 (cleaning), SBSE 13 (maintenance), SBSE 14 (custodial service), SBSE 7 (filing), SSF 10 (logistic), SSF 5 (conference room), SSF 6 (meeting room), SSF 7 (furniture and equipment rental), SSF 8 (canteen), and SSF 9 (~~s~~Shipping and receiving).

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4.2 Indicator Validity Test

4.2 According to Fornell and Larcker (1981), the square root of each latent construct's AVE could determine discriminant validity, if this value ~~were is~~ greater than other correlations among the latent constructs. The square root of AVE for each construct ~~was~~ compared with the correlations between all pairs of latent constructs. ~~If the model has enough discriminant validity if the square root of the AVE for each construct were is larger than the correlations between all pairs of the constructs in the model, then the model has enough discriminant validity.~~ When the square root of ~~the~~ AVE is greater than the correlations between the constructs, the level of validity of the constructs is considered satisfactory. ~~As a result, eHence, each construct -was~~ considered as having high validity. All the square roots of ~~the~~ AVE exceeded the correlation values between other constructs and all the square roots of latent variables in each column. ~~Therefore, the results, therefore, showed~~ satisfactory discriminant validity.

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4.3 Effect Size Value

4.3 The effect size ~~was~~ calculated to evaluate the impact of a predictor construct on an endogenous construct. Credits and rewards, entry criteria, exit criteria, and funding support had ~~ave~~ strong effect size on the success factors. The effect sizes of funding and support to success factors, good system and infrastructure to success factors, information technology to the quality of facility ~~and~~ mentoring-networking to good system and infrastructure ~~were~~ strong. The correlation between university regulations and credits-and-rewards ~~was~~ strong. Table 1 and Figure 1 show the effect size of business incubator success factors.

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The ~~s~~Success ~~f~~Factors of Indonesian ~~p~~Public ~~u~~University ~~b~~Business ~~i~~Incubators are: ~~(+) The aAbility of the bBusiness iIncubator, eEntry cCriteria, eExit cCriteria, fFunding and sSupport, gGovernment sSupport and pProtection, iIncubator gGovernance, mMentoring and nNetworking, sSystem iInfrastructure, and uUniversity rRegulation.~~

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It is necessary for ~~k~~Knowledge-intensive firms ~~need~~ to possess the capability, competency, and the right attitudes at both individual and firm levels to convert new thinking, technologies, and creations into economic and social value by using pioneering business models (Byers et al., 2010; Mitchelmore and Rowley, 2010; Passiante and Romano, 2016).

The importance performance map analysis, as ~~shown-presented~~ in Figure 2, shows the strong correlations between ~~m~~Mentoring-~~n~~Networking and ~~g~~Good ~~s~~System and ~~i~~Infrastructure ~~as well as, between uUniversity rRegulations and cCredits-and-rRewards and, between iInformation tTechnology and some other services and aAge-and-qQuality fFacilities.~~

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Table 1. The Effect Size Business Incubator Success Factors							
	Age and Quality of Facilities	Credits and rewards	Entry Criteria	Exit Criteria	Funding Support	Good System and Infrastructure	Success Factors
Age and Quality of Facilities							0.044
Credits and Rewards	0.150						
Entry Criteria							
Exit Criteria							
Financial Accounting Consultation	0.006						
Funding Support							
Good System and Infrastructure							1.114
Government Support and Protection		0.003					
Incubator Governance		0.018					
Information Technology	0.727						
Management Human Resource and Assistance	0.280						
Marketing Assistance	0.004						
Mentoring-Networking						0.321	
Physical Logistic Facilities	0.047						
Professional Business Service and Etiquette	0.009						
Shared Business Service and Equipment	0.232						
Success Factors			1.409	1.076	1.377		
System Infrastructure						0.035	
University Regulations		0.302					

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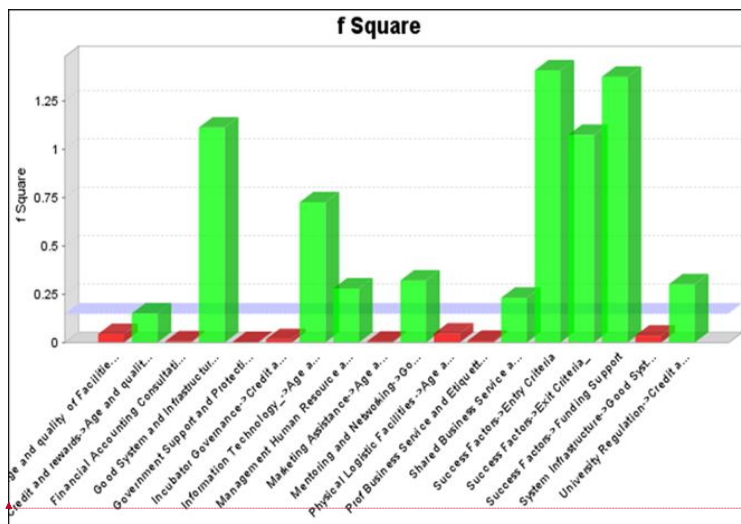


Figure 1. Effect Size of Business Incubator Success Factors.

4.4 Structural Path Coefficient

4.4

After the model was entered into the SEM software package and the analysis was conducted, the result of the fitness measures will indicated whether the research hypotheses are-were accurate or vice versa-not. The ratio of each parameter to its standard error correspondeds to a z test for the significance of the relationship; with $p = 0.05$ and a standard deviation of 1.96 (Jackson et al., 2005).

The strong effect of critical success factors and moderating factors in business incubators for Indonesian public universities are; (a) Credit and Rewards to Age and the Quality of the Facilities; (b) Information Technology to Age and the Quality of the Facilities; (c) Mentoring-n Networking to Good sSystem and iInfrastructure; (d) success factors to eEntry cCriteria, eExit cCriteria, and the fFunding supportSystem directly to Suceess Factor; and (e) the uUniversities' rRegulations to cCredits and rRewards factors (refer to Table 2).

Table 2. Structural Path Coefficient Model for this Research.

No.	Critical Success Factors	T statistics	P values
1	Age and quality- of fFacilities → Success fFactors	0.836	0.404
2	Credit and rewards → Age and quality -of fFacilities	1.513	0.131
3	Financial aAccounting cConsultation → Age and quality -of fFacilities	0.282	0.778
4	Good sSystem and iInfrastructure → Success fFactors	4.996	0.000
5	Government sSupport and pProtection → Credit and rewards	0.226	0.821
6	Incubator gGovernance → Credit and rewards	0.435	0.664
7	Information tTechnology → Age and quality -of fFacilities	2.786	0.006
8	Management hHuman rResource & aAssistance → Age and& quality	1.241	0.215
9	Marketing aAssistance → Age and quality- of fFacilities	0.136	0.892
10	Mentoring and nNetworking → Good sSystem and iInfrastructure	2.738	0.006
11	Physical lLogistic fFacilities → Age and quality -of fFacilities	0.656	0.512
12	Prof Business Service and Etiquette → Age and quality -of fFacilities	0.267	0.789

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No.	Critical Success Factors	T statistics	P values
13	Shared business service and equipment → Age and quality of	1.289	0.198
14	Success factors → Entry criteria	11.433	0.000
15	Success factors → Exit criteria	6.152	0.000
16	Success factors → Funding support	10.521	0.000
17	System infrastructure → Good system and infrastructure	0.819	0.413
18	University regulation → Credits and rewards	2.354	0.019

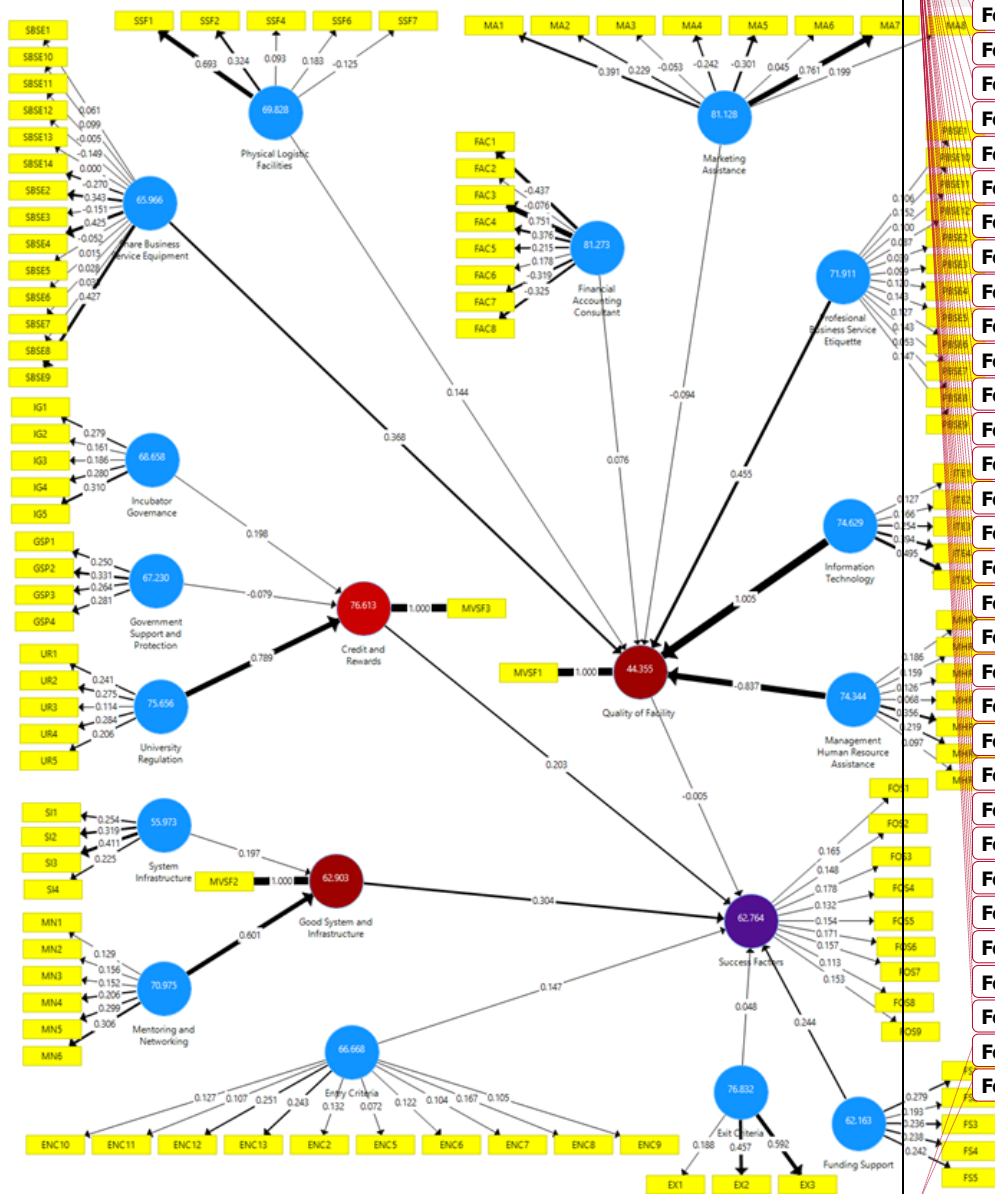


Figure 2. Importance Performance Map Analysis of the Factors of Successful Business Incubators Among Indonesian Public Universities.

5. CONCLUSION

The results of ~~the research~~this study demonstrated that ~~the~~ effect of critical success factors, ~~namely~~ entry criteria (Campbell, 1989), exit criteria (Campbell, 1989), funding support (O'Neal 2005), mentoring-networking (Agnete, 2011; Miller et. al., 2011), and university regulations (Mian 1997), directly affect the business incubators for Indonesian public universities. Furthermore, the results ~~also~~ showed that the moderating factors, ~~namely~~ credit and rewards (O'Neal, 2005), good system and infrastructure (O'Neal, 2005), and the age and quality of the facilities (Verma, 2004), significantly affect university regulations, mentoring-networking, and information technology, respectively.

A good system and infrastructure ~~showeds~~ a strong relationship with ~~the~~ success factors directly, and information technology ~~showeds~~ a strong relationship with the moderating factors, especially age and the quality of the facilities. Mentoring and networking ~~showshad~~ a strong ~~relationship-connection to with~~ the moderating factors, namely good system and infrastructure, and university regulations ~~hads~~ a strong relationship with the moderating factor of credit and rewards. It cannot be denied that entry criteria, exit criteria, and funding support ~~show~~ strong relationships directly to are associated with the success factors. This finding could improve the management of business incubators in Indonesian public universities and make them more for it to be successful. These research findings may facilitate-persuade Indonesian public university business incubators to give more attention to the development and management of the business incubators on their own.

This ~~Since the~~ study has ascertained the effect of critical success factors and moderating factors for the business incubators in Indonesian public universities. Voisey (2006) ~~utilised~~utilized business incubator measurement to manage business incubators performance, economic policymakers, and stakeholders of the importance of learning strategies. Universities' business incubator regulations and environments enable and encourage the start-ups to exchange ideas and achieve success in business creation. The entry criteria are important not only to select start-ups to implement their business ideas, but also to support business learning communities in entrepreneurship learning programs.

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CRITICAL SUCCESS AND MODERATING FACTORS EFFECT IN INDONESIAN PUBLIC UNIVERSITIES' BUSINESS INCUBATORS

ABSTRACT

This study aims to examine the effect of critical success and moderating factors in Indonesian public universities' business incubators. The study of business incubators benefits university professors in their roles as managers and advisors, university faculty entrepreneurs and start-ups/tenants in the knowledge transfer and entrepreneurship learning processes, and government officials in effective policy making. For the universities, the incubators serve as a platform for the commercialization of their research efforts. The incubators assist the universities' stakeholders in fulfilling their newly identified responsibilities towards building the nation's economy and giving the faculty members and graduate students the chance to conduct research. Regarding the economic environment, the incubators help create job opportunities, increase the country's economic value, and reduce poverty. This research employed the quantitative method approach, and the data were analyzed using the IBM SPSS version 23 and Smart PLS version 3 statistical software packages. The samples of this research were comprised of 31 business incubator managers from Indonesian public universities. Although there have been previous models about critical success and moderating factors for business incubators in other countries, this study is the first that was conducted in Indonesia and found direct and indirect relationships between critical success factors and moderating success factors for Indonesian Public University Business Incubators. The results of the research demonstrated that good system and infrastructure show a strong direct relationship with success factors and that information technology shows a strong relationship with the moderating factors, namely age and quality of facilities. Furthermore, mentoring and networking showed a strong relationship with the moderating factors good system and infrastructure and that university regulation had a strong relationship with moderating factor credit and rewards. Entry criteria, exit criteria, and funding support showed strong direct relationships to success factors. These findings could improve the management of business incubators in Indonesian Public Universities and allow them to more successful.

Keywords: Critical Success Factors; Moderating Factors; University Business Incubators; Indonesian Public Universities

1. INTRODUCTION

While the term "entrepreneurship" has various meanings, it can be defined as "the process of uncovering or developing an opportunity to create value through innovation" (Kaufmann Center, Macke and Kayne, 2001). According to Feldman (2016), research on university faculty, staff and entrepreneurial capacities may be extended and investigated in various areas of study. In the long run, business enterprises are crucial elements in determining economic success (Romer, 1994). In addition, during economic recessions, new firms play a crucial role in providing employment, proliferating inventions and driving a country's economy (Dana, 2004; Engle et al., 2010; Ahmed et al., 2010).

Researchers, policymakers, operators of business incubators and stakeholders do not have an adequate and proper method to monitor and appraise business incubators' performances in

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various business sectors and diverse geographical areas. Previous studies lack the theories, methodologies and empirical data to appraise business incubators' performance and their impact on the economy, even though they are of particular interest to academics and industry practitioners alike (Lewis, 2001; Cornelius and Bhabra-Remedios, 2003). Therefore, business incubators are expected to define their own performance measurements (Voisey, 2006).

According to the National Business Incubation Association (NBIA) (2003), an important factor in the appraisal of an incubator's performance is the service provision method, but it has not been given enough attention. There is a lack of research about how the services have been extended to the incubators. The incubators goal is to discover whether the services are provided by their managers, boards or mentors, or through internal courses or other methods.

The failure rate in the early stage of start-ups is 90% (Patel, 2015; Griffith, 2017). Data on the rates of business failures are frequently quoted (NBIA, 2003). According to the U.S. Small Business Administration, only 44% of firms stay in business four years after the commencement of operation. This is contradictory to the data gathered by the NBIA, which reports that 87% of graduate firms remained in business ten years after the commencement of operation. On account of the data of failed start-ups, it becomes necessary to identify the critical success factors of building business incubators for public universities in Indonesia. This study's objective, **therefore**, is to identify the critical success factors in those incubators. The focus of this study is on the activities of Indonesian public universities' business incubators, especially the capabilities and the activities of 31 business incubator managers.

Indonesia's fast growing middle-class market is a fertile ground for start-up enterprises, both local and foreign. This trend presents promising prospects across various industries, including technology, communication, creative and social enterprises. Nurturing a resilient business sector will result in the creation of new jobs and more business prospects across industries, which makes it critical for the economic **growth** of developing countries (Singtel, 2017).

There is no previous research that addresses the effect of critical success and moderating factors towards a business incubator's success, especially among Indonesian public university business incubators. The main purpose of this research is to identify the direct and indirect relationships between critical success factors and moderating success factors for Indonesian public university business incubators.

A well-known cultural issue, **however**, is that Indonesians are less **likely** to initiate their own business ventures. According to a study by the Global Entrepreneurship Monitor, 14.5% of Americans and 7.2% of Singaporeans are keen to start up their own **businesses**. These statistics stand in **stark** contrast to the less than one percent of Indonesians who are willing to do the same (Frazier, 2012).

2. LITERATURE REVIEW

2.1. University Business **Incubators**

The clients of the University of Central Florida's Business Incubation Program receive **extensive** benefits regarding business, technology and entrepreneurial support (O'Neal, 2005). The incubator is emphasized **as one of the several critical success factors** that will ensure a **client's** success by: (1) incorporating clients into a larger technology development system; (2) encouraging interaction among **clients**, incubator management and its employees, external parties and the incubator's advisory panel; and (3) giving access to external financing, university resources, economic development agencies in the local community/government and other business support **organizations**.

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Currently, there is a higher degree of support from the university incubators for small firms in the latter's quest for long-term viability and development that involves networking among the entrepreneurs. Several previous studies have investigated the importance of networking for entrepreneurs in detail, and they emphasize the steps towards developing and maintaining relationships within the business setting (Aldrich & Zimmer, 1986; Shaw & Conway, 2000; Hoang & Antoncic, 2003; Neergaard, 2005). Among the advantages offered by the incubator are networks and cooperation, and many businesses would be keen to collaborate with the best of them if they were given the opportunity (Ageton, 2011). Therefore, according to Miller et al. (2011), more attention ought to be given to keeping and preserving knowledge because it would assist in the universities' technology transfer processes, especially on account of the fleeting nature of spin out companies evolving through the process.

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2.2. Regulation of Business Incubators in Indonesian Universities

To improve the well-being of the country's citizens, it is necessary for the government to tackle a major challenge, namely unemployment. The Central Bureau of Statistics (CBS) of Indonesia revealed that 5.33% of Indonesia's workforce were unemployed and 11.5% of the population were below the poverty line in 2017. In support of the government's program to alleviate poverty, entrepreneurship projects at public universities are expected to help provide employment, which will also reduce the number of poor people.

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In September 2017, the Federal Open Market Committee (FOMC) reported that the normal unemployment rate should be between 4.4% and 5% with a median value of 4.6%. Regrettably, 5.33%, or 7.02 million of Indonesia's population, were unemployed (CBS, 2017). Additionally, 2.07%, or 3.4 million of the country's population, were illiterate (Ministry of Education and Culture, 2017). To make matters worse, uneducated people are often used in demonstrations in Indonesia. These people are in dire need of jobs that can help improve their economic and financial conditions. Business incubators, therefore, play an important role because they will help Indonesia resolve some of its economic problems by creating jobs and graduated firms.

With assistance from the Cooperative Department and universities, the government of Indonesia has established the incubators in the country since 1992. This initiative was given a boost in 1997 by a program known as the Development of Entrepreneurship Culture in Universities, where activities included the New Entrepreneurs' Incubators (Bank Indonesia, 2006).

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In addition to Indonesian regulations about business incubators, the terms of business incubators, incubation activity, and incubation participation are governed by the Presidential Regulation number 27/2013, the Development of Entrepreneurial Incubators. Further, in the Ministry of Cooperatives and Micro, Small and Medium Enterprises had introduced Regulation No. 24/Per/M.KUKM/IX/2015 on Norms, Standards, Procedures, and Criteria (NSPK) of the Management of Entrepreneurial Incubators. This regulates the administrative matters of an incubator, including registration, required standards, required services, expected output of an incubator and its tenant and a targeted number of incubators in the country. Some of the parameters regarding the regulation, however, are unspecific, such as the employees' standards of professionalism, the provisions of sufficient facilities and infrastructure and measurements of the incubators' success indicators.

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2.3. Business Incubator Successful Factor Development

Most problems that entrepreneurs encounter at the early stages of business development are a lack of legitimacy, experience, tangible resources and accumulated knowledge, which are

success factors that allow them to recognize and seize business opportunities. Business incubators do not guarantee graduate tenant company. Evaluating all of the emerging critical success factors, however, can minimize failures once the company enters the business incubator (Lumpkin, 1988).

The initial framework by Campbell, Kendrick and Samuelson (1985) emerged with the simple business incubator services and facilities. The business incubator framework started with entry criteria, selection processes, funding and mentoring-networking for tenant business growth.

Smilor (1987) introduced a non-profit business incubator framework whose model implicates the tenant business mission, such as economic development, successful products, a tenant's profit, technology diversification and job creation. Smilor's framework involved support systems, namely administration, facilities and business expertise, from universities and the government. His extensive work strives to ascertain and elaborate upon the different elements of an incubation system. Campbell (1989) introduced a new incubation process model that consisted of a pre-incubation process, entry criteria and selection processes and monitoring and controlling processes. The previous models by Campbell et al. (1985) and Smilor (1987) did not introduce the processes and activities from the pre-incubation and incubation processes until successful outcomes were achieved. Mian (1997) provided more detailed processes, criteria, policies and programs and sought the involvement of universities, communities and other stakeholders for the development of a theoretical model to evaluate and manage the university-based technology business incubators' (UTBI) performance. For the first time, Mian introduced the university involvement and developed performance criteria for technology business incubators in the public and private sectors.

The business incubator model is categorized as pre-incubation activities or input (entry criteria), incubation or process and graduation or output (exit criteria) (Costa-David, Malan, & Lalkaka, 2002). Costa-David et al. were the first to outline the detailed skill requirements, such as management, finance, business advice, networking and training for start-ups until their graduation. Verma's (2004) framework introduced more detailed success factors, namely shared services, facilities and location, financing and support, control of incubators, mentoring-networking, entry criteria and exit criteria, as well as moderating factors, such as age and the quality of facilities for a successful business incubator framework. Voisey (2006) introduced the concepts of hard (profitability, sales turnover, etc.) and soft (business skill improvement, cost saving, etc.) performance measurements of business incubator practice achievement.

3. RESEARCH METHODOLOGY

Each of the 9 success factors, 3 moderating factors and 115 indicators in this research was investigated in Gozali et al. (2015). The development of a proposed initial framework of successful business incubators in Indonesian public universities from previous business incubator's model and framework was also explored by Gozali et al. (2016). The research was addressed using mixed methods, specifically qualitative and quantitative methods. In the qualitative method, the literature study and expert interviews were conducted in Indonesian public university business incubators to develop the questionnaire. In the quantitative method, data collection, data calculation (reliability and validity) and a calculation of the business incubators' success factors' value were performed. The data were collected from March to October 2016.

3.1 Research Location

This research was conducted in Indonesia with the participation of 18 Indonesian public university business incubators, comprising Universitas Sumatera Utara, Universitas Andalas,

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Universitas Indonesia, Institut Pertanian Bogor, Universitas Diponegoro, Universitas Sam Ratulangi, Universitas Brawijaya, Universitas Airlangga, Institut Teknologi Sepuluh Nopember, Universitas Riau, Universitas Udayana, Universitas Gorontalo, Universitas Sebelas Maret, Universitas Jambi, Universitas Padjajaran, Bandung Techno Park, Universitas Negeri Yogyakarta and Institut Teknologi Bandung.

3.2 Research Sample

The sample of this research is comprised of incubator managers in public universities in Indonesia who oversaw the daily activities of the incubators and graduated tenant companies. The samples were selected as the managers had the required understanding and experience in incubator management as well as in handling the relationships among tenant companies within the incubators.

This research saw the participation of 77.4% male and 22.6% female respondents in the age ranges of below 30 years old (3.2%), 30–39 years old (29%), 40–49 years old (19.4%), 50–59 years old (35.5%) and over 60 years old (12.9%). All the respondents were business incubator managers. The respondents' levels of education consisted of Bachelor's degrees (6.5%), Master's degrees (51.6%) and Doctorate degrees (41.9%).

4. DATA ANALYSIS AND RESULTS

4.1 Indicator Reliability Test

This study employed a mixed-method research design, namely quantitative and qualitative methods, which uses a sequential explanatory design that begins with data collection from a literature review and develops a quantitative study that is supplemented by data from in-depth, one-on-one interviews. The status of the quantitative aspects of the research was considered higher than the qualitative because the interviews with the expert were based on empirical data, which was collected first. The quantitative study continued with reliability and validity tests, research hypotheses tests and a structural model test. The research used the case study as a part of the qualitative method to examine the differences among public university business incubators in Indonesia.

The data was analyzed using statistical software IBM SPSS version 23 and Smart PLS version 3. The Cronbach alpha values that were calculated are larger than 0.6 (Hair et al., 2012). All of the reflective latent variables, therefore, have high levels of internal consistency reliability. Composite reliability that was calculated is larger than 0.7, which confirms the composite reliability (Bagozzi and Yi, 1988). Furthermore, convergent validity, such as the average variance extracted (AVE) of the latent variables should exceed the acceptable threshold value of 0.5 (Bagozzi and Yi, 1988). Some indicators showed an unacceptable reliability test and they were removed from the research. The indicators that did not meet the threshold were FAC 1 (business taxes), FAC 2 (risk and management unit), FAC 7 (export development assistance), FAC 8 (writing financial report, ratio and balances), SBSE 1 (audio visual equipment), SBSE 10 (office hour answering service), SBSE 11 (air conditioner), SBSE 12 (cleaning), SBSE 13 (maintenance), SBSE 14 (custodial service), SBSE 7 (filing), SSF 10 (logistic), SSF 5 (conference room), SSF 6 (meeting room), SSF 7 (furniture and equipment rental), SSF 8 (canteen) and SSF 9 (shipping and receiving).

4.2 Indicator Validity Test

According to Fornell and Larcker (1981), the square root of each latent construct's AVE could determine discriminant validity, if this value is greater than other correlations among the latent

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constructs. The square root of AVE for each construct was compared with the correlations between all pairs of latent constructs. If the square root of the AVE for each construct is larger than the correlations between all pairs of the constructs in the model, then the model has enough discriminant validity. When the square root of the AVE is greater than the correlations between the constructs, the level of validity of the constructs is considered satisfactory. As a result, each construct was considered as having high validity. All the square roots of the AVE exceeded the correlation values between other constructs and all the square roots of latent variables in each column. The results, therefore, showed satisfactory discriminant validity.

4.3 Effect Size Value

The effect size was calculated to evaluate the impact of a predictor construct on an endogenous construct. Credits and rewards, entry criteria, exit criteria and funding support had a strong effect size on the success factors. The effect sizes of funding and support to success factors, good system and infrastructure to success factors, information technology to the quality of facility and mentoring-networking to good system and infrastructure were strong. The correlation between university regulations and credits-and-rewards was strong. Table 1 and Figure 1 show the effect size of business incubator success factors.

The success factors of Indonesian public university business incubators are: the ability of the business incubator, entry criteria, exit criteria, funding and support, government support and protection, incubator governance, mentoring and networking, system infrastructure and university regulation.

It is necessary for knowledge-intensive firms to possess the capability, competency and the right attitudes at both individual and firm levels to convert new thinking, technologies and creations into economic and social value by using pioneering business models (Byers et al., 2010; Mitchelmore and Rowley, 2010; Passiante and Romano, 2016).

The importance performance map analysis, as presented in Figure 2, shows the strong correlations between mentoring-networking and good system and infrastructure as well as university regulations and credits-and-rewards and between information technology and other services and age-and-quality facilities.

Table 1. The Effect Size Business Incubator Success Factors.

	Age and Quality of Facilities	Credits and rewards	Entry Criteria	Exit Criteria	Funding Support	Good System and Infrastructure	Success Factors
Age and Quality of Facilities							0.044
Credits and Rewards	0.150						
Entry Criteria							
Exit Criteria							
Financial Accounting Consultation	0.006						
Funding Support							
Good System and Infrastructure							1.114
Government Support and Protection		0.003					
Incubator Governance		0.018					

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	Age and Quality of Facilities	Credits and rewards	Entry Criteria	Exit Criteria	Funding Support	Good System and Infrastructure	Success Factors
Information Technology	0.727						
Management Human Resource and Assistance	0.280						
Marketing Assistance	0.004						
Mentoring-Networking						0.321	
Physical Logistic Facilities	0.047						
Professional Business Service and Etiquette	0.009						
Shared Business Service and Equipment	0.232						
Success Factors			1.409	1.076	1.377		
System Infrastructure						0.035	
University Regulations		0.302					

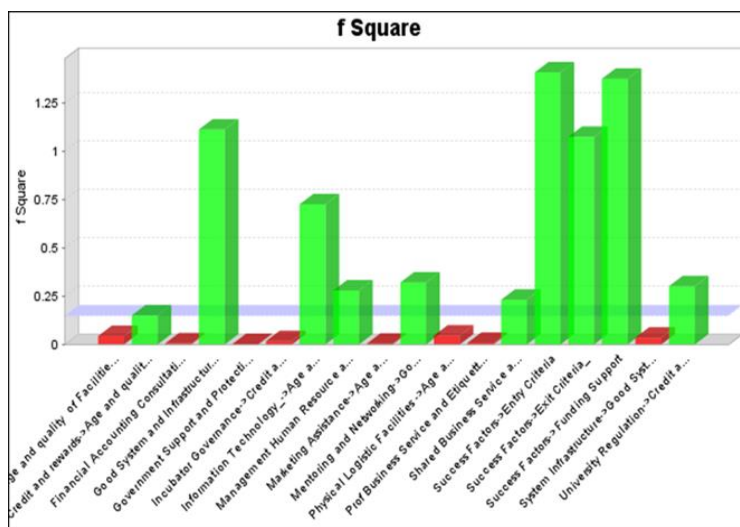


Figure 1. Effect Size of Business Incubator Success Factors.

4.4 Structural Path Coefficient

After the model was entered into the SEM software package and the analysis was conducted, the result of the fitness measures indicated whether the research hypotheses were accurate or not. The ratio of each parameter to its standard error corresponded to a z test for the significance of the relationship with $p = 0.05$ and a standard deviation of 1.96 (Jackson et al., 2005).

The strong effect of critical success factors and moderating factors in business incubators for Indonesian public universities are: (a) credit and rewards to age and the quality of the facilities; (b) information technology to age and the quality of the facilities; (c) mentoring-networking to

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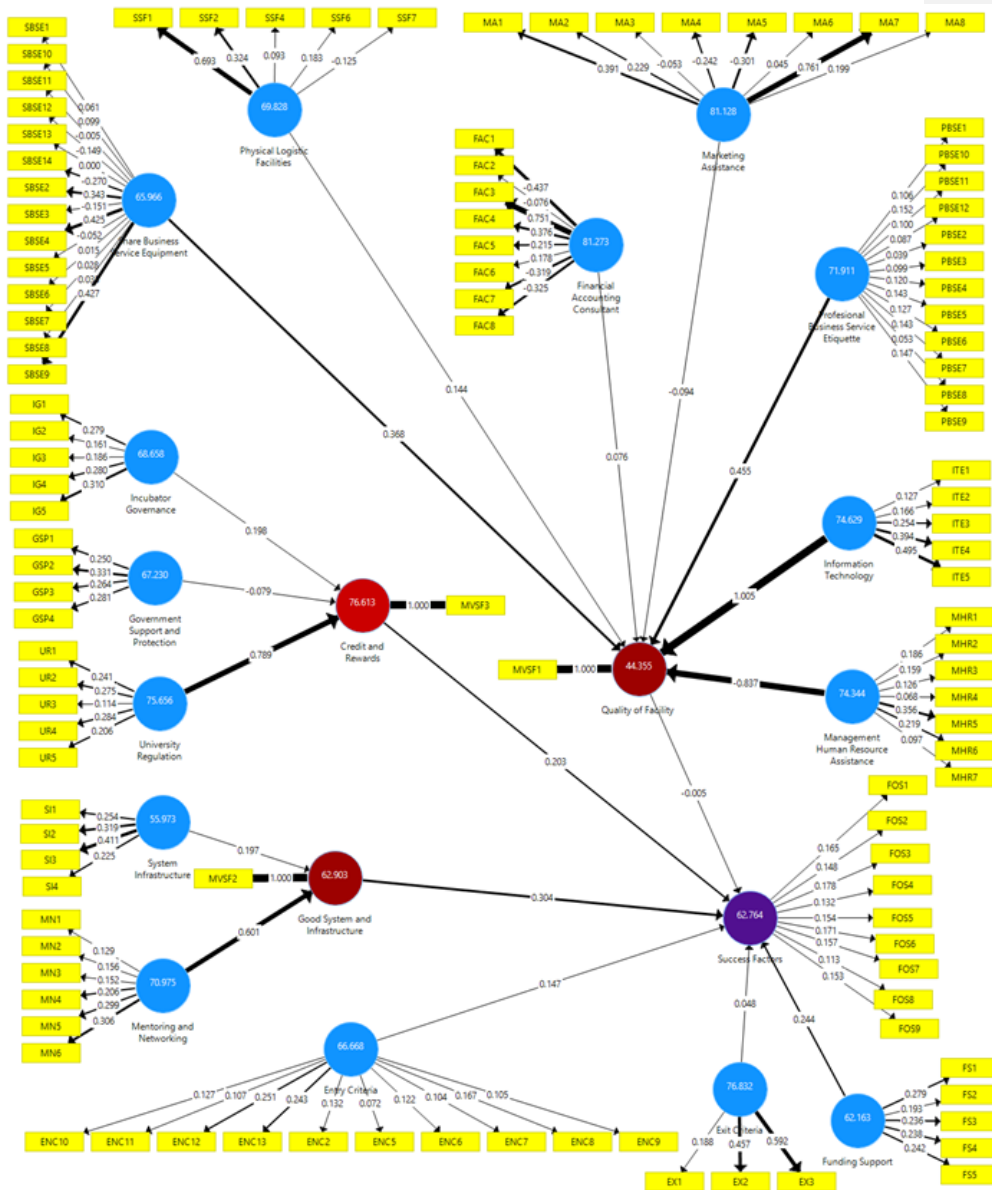
good system and infrastructure; (d) success factors to entry criteria, exit criteria, and the funding support; and (e) the universities' regulations to credits and rewards factors (refer to Table 2).

Table 2. Structural Path Coefficient Model for this Research.

No.	Critical Success Factors	T statistics	P values
1	Age and quality of facilities → Success factors	0.836	0.404
2	Credit and rewards → Age and quality of facilities	1.513	0.131
3	Financial accounting consultation → Age and quality of facilities	0.282	0.778
4	Good system and infrastructure → Success factors	4.996	0.000
5	Government support and protection → Credit and rewards	0.226	0.821
6	Incubator governance → Credit and rewards	0.435	0.664
7	Information technology → Age and quality of facilities	2.786	0.006
8	Management human resource & assistance → Age and quality facilities	1.241	0.215
9	Marketing assistance → Age and quality of facilities	0.136	0.892
10	Mentoring and networking → Good system and infrastructure	2.738	0.006
11	Physical logistic facilities → Age and quality of facilities	0.656	0.512
12	Prof Business Service and Etiquette → Age and quality of facilities	0.267	0.789
13	Shared business service and equipment → Age and quality of facilities	1.289	0.198
14	Success factors → Entry criteria	11.433	0.000
15	Success factors → Exit criteria	6.152	0.000
16	Success factors → Funding support	10.521	0.000
17	System infrastructure → Good system and infrastructure	0.819	0.413
18	University regulation → Credits and rewards	2.354	0.019

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5. CONCLUSION

The results of this study demonstrated that the effect of critical success factors, namely entry criteria (Campbell, 1989), exit criteria (Campbell, 1989), funding support (O'Neal 2005), mentoring-networking (Agnete, 2011; Miller et al., 2011) and university regulations (Mian 1997), directly affect the business incubators for Indonesian public universities. Furthermore, the results showed that the moderating factors, namely credit and rewards (O'Neal, 2005), good system and infrastructure (O'Neal, 2005) and the age and quality of the facilities (Verma, 2004), significantly affect university regulations, mentoring-networking and information technology, respectively.

A good system and infrastructure showed a strong relationship with the success factors, and information technology showed a strong relationship with the moderating factors, especially age and the quality of the facilities. Mentoring and networking had a strong connection to the moderating factors, namely good system and infrastructure, and university regulations had a strong relationship with the moderating factor of credit and rewards. It cannot be denied that entry criteria, exit criteria and funding support are associated with the success factors. This finding could improve the management of business incubators in Indonesian public universities and make them more successful. These research findings may persuade Indonesian public university business incubators to give more attention to the development and management of the business incubators on their own.

This study has ascertained the effect of critical success factors and moderating factors for the business incubators in Indonesian public universities. Voisey (2006) utilized business incubator measurement to manage business incubators performance, economic policymakers and stakeholders of the importance of learning strategies. Universities' business incubator regulations and environments enable and encourage the start-ups to exchange ideas and achieve success in business creation. The entry criteria are important not only to select start-ups to implement their business ideas, but also to support business learning communities in entrepreneurship learning programs.

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Journal reference style:

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**CRITICAL SUCCESS AND MODERATING FACTORS EFFECT IN INDONESIAN
PUBLIC UNIVERSITIES' BUSINESS INCUBATORS**

ABSTRACT

This study aims to examine the effect of critical success and moderating factors in Indonesian public universities' business incubators. The study of business incubators benefits university professors in their roles as managers and advisors, university faculty entrepreneurs and start-ups/tenants in the knowledge transfer and entrepreneurship learning processes, ~~as well as and~~ government officials in effective policy making. For the universities, the incubators serve as a platform for ~~the commercialisation~~ commercialization of their research efforts. The incubators assist the universities' stakeholders in fulfilling their newly identified responsibilities towards building the nation's economy and giving the faculty members and graduate students the chance to conduct research. ~~For~~ Regarding the economic environment, the incubators help ~~to~~ create job opportunities, increase the country's economic value, and reduce poverty. This research employed the quantitative method approach, and the data were ~~analysed~~ analyzed using the IBM SPSS version 23 and Smart PLS version 3 statistical software packages. The samples of this research ~~were~~ comprised of 31 business incubator managers from Indonesian public universities. ~~There~~ Although there have been previous models about critical success and moderating factors for business incubators in other countries, ~~and~~ this study is the first study that was conducted in Indonesia ~~that and~~ found direct and indirect relationships between critical success factors and moderating success factors for Indonesian Public University Business Incubators. The results of the research demonstrated that good system and infrastructure show a strong direct relationship with success factors ~~and~~ that information technology shows a strong relationship with the moderating factors, ~~namely:~~ age and quality of facilities. Furthermore, mentoring and networking ~~showed~~ a strong relationship with the moderating factors good system and infrastructure ~~and that~~ university regulation had a strong relationship with moderating factor credit and rewards. Entry criteria, exit criteria, and funding support ~~showed~~ strong direct relationships to success factors. ~~These~~ findings could improve the management of business incubators in Indonesian Public Universities ~~and allow them to in order to be~~ more successful.

Keywords: Critical Success Factors; Moderating Factors; University Business Incubators; Indonesian Public Universities

1. INTRODUCTION

While the term "entrepreneurship" ~~represents~~ has various meanings, it ~~could~~ can be defined as "the process of uncovering or developing an opportunity to create value through innovation" (Kaufmann Center, Macke and Kayne, 2001). According to Feldman (2016), research on university faculty, staff and entrepreneurial capacities ~~may~~ can be extended and investigated in various areas of study. In the long run, business enterprises are crucial elements ~~for in~~ determining economic success (Romer, 1994). In addition, during economic recessions, new firms play a crucial role in providing employment, proliferating ~~inventions~~ and driving the a country's economy (Dana, 2004; Engle et al., 2010; Ahmed et al., 2010).

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Researchers, policymakers, operators of business incubators, and stakeholders do not have an adequate and proper method to monitor and appraise business incubators' performances in various business sectors and diverse geographical areas. Previous studies ~~have been lacking in lack the~~ theories, methodologies, and empirical data to appraise business incubators' performance and their impact on the economy, ~~even though they are of particular interest to despite gaining substantial interest from~~ academicians and industry practitioners alike (Lewis, 2001; Cornelius and Bhabra-Remedios, 2003). ~~Therefore, business~~ Therefore, business incubators are expected to define their own performance measurements (Voisey, 2006).

According to the National Business Incubation Association (NBIA) (2003), an important factor in the appraisal of ~~an incubator's~~ performance is the service provision method, ~~and yet, but~~ it has not been given enough attention. There is a lack of research ~~as about~~ how the services have been extended to the incubators. The incubators ~~goal is are interested~~ to discover whether the services are provided by their managers, boards, or mentors, or through internal courses or other ~~ways~~ methods.

The failure rate in the early stage of start-ups is 90% (Patel, 2015; Griffith, 2017). Data on the rates of business failures are frequently quoted (NBIA, 2003). According to the U.S. Small Business Administration, only 44% of firms stay in business four years after ~~the~~ commencement of operation. This is contradictory to the data gathered by the NBIA, which ~~is reports that~~ 87% of graduate firms remained in business ten years after ~~the~~ commencement of operation. ~~From On account of~~ the data of failed start-ups, ~~it becomes necessary to there is a need to~~ identify the critical success factors of building business incubators for ~~the~~ public universities in Indonesia. ~~Therefore,~~ this study's objective, ~~therefore,~~ is to identify the critical success factors in those incubators. The focus of this study ~~will be is~~ on the activities of Indonesian public universities' business incubators, especially the capabilities and the activities of 31 business incubator managers.

Indonesia's fast growing middle-class market is a fertile ground for start-up enterprises, both local and foreign. This trend presents promising prospects across various industries, including technology, communication, creative and social enterprises, ~~among others~~. Nurturing a resilient business sector will result in the creation of new jobs and more business prospects across industries, ~~which makes it and is therefore~~ critical for ~~the~~ economic ~~development growth in of~~ developing countries (Singtel, 2017).

There is ~~no~~ previous research ~~about that addresses~~ the effect of critical success and moderating factors ~~towards atowards a~~ business incubator's success, especially among Indonesian public university business incubators. The main purpose of this research is to identify the direct and indirect relationships between critical success factors and moderating success factors for Indonesian public university business incubators.

~~A However, a~~ well-known cultural issue, ~~however,~~ is that Indonesians ~~have a low tendency are less likely~~ to initiate their own business ventures. According to a study by the Global Entrepreneurship Monitor, 14.5% of Americans and 7.2% of Singaporeans are keen to start up their own businesses. ~~These statistics stand in stark in~~ contrast to ~~only the~~ less than one percent of Indonesians who are willing to do ~~so the same~~ (Frazier, 2012).

2. LITERATURE REVIEW

2.1. University Business Incubators

The clients of the University of Central Florida's Business Incubation Program ~~gain receive huge extensive~~ benefits ~~in terms of regarding~~ business, technology, and entrepreneurship support (O'Neal, 2005). The incubator ~~is emphasised emphasized on as one of the~~ several critical

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success factors ~~that will~~ to ensure ~~its a client's~~ success by: (1) incorporating clients into a larger technology development system; (2) encouraging ~~engagements interaction~~ among clients, incubator management and its employees, external parties, and the incubator's advisory panel; and (3) giving access to external financing, university resources, economic development agencies in the local community/government, and other business support ~~organisations organizations~~.

~~Today~~Currently, there is a higher degree of support from the university incubators for small firms in the latter's quest for long-term viability and development that involves networking among the entrepreneurs. Several previous studies have investigated ~~in detail~~ the importance of networking for entrepreneurs ~~in detail, and they emphasize with emphasis on~~ the steps towards developing and maintaining relationships within the business setting (Aldrich & Zimmer, 1986; Shaw & Conway, 2000; Hoang & Antoncic, 2003; Neergaard, 2005). Among the advantages offered by the incubator are networks and cooperation, and many businesses would be keen ~~if presented with the chance~~ to collaborate with the best ~~among of~~ them ~~if they were given the opportunity~~ (Agnete, 2011). Therefore, according to Miller et al. (2011), ~~a lot of more~~ attention ~~should ought to~~ be given ~~towards~~ keeping and preserving knowledge ~~in networks in order to because it would~~ assist in the ~~universities'~~ technology transfer processes, ~~especially on account of the universities because~~ of the fleeting nature of spin out companies evolving through the process.

2.2. Regulation of Business Incubators in Indonesian Universities

~~In order to~~ improve the well-being of ~~the~~ country's citizens, ~~it is necessary for~~ the government ~~needs to~~ tackle a major challenge, ~~which namely is~~ unemployment. The Central Bureau of Statistics (CBS) of Indonesia revealed that ~~in 2017~~, 5.33% of Indonesia's workforce were unemployed and 11.5% of the population were below the poverty line ~~in 2017~~. In support of the government's programme to alleviate poverty, entrepreneurship projects at ~~the~~ public universities are expected to help provide employment, ~~which will also and hence~~, reduce the number of poor people.

~~In September 2017~~, ~~(The~~ Federal Open Market Committee (FOMC) ~~reported stated in its report in September 2017~~ that the normal unemployment rate should be between 4.4% and 5% with a median value of 4.6%. Regrettably, 5.33%, or 7.02 million of Indonesia's population, were unemployed (CBS, 2017). Additionally, 2.07%, or 3.4 million of the country's population, were illiterate (Ministry of Education and Culture, 2017). To make matters worse, uneducated people are often used in demonstrations in Indonesia. These people are in dire need of jobs that can help improve their economic and financial conditions. ~~B Thus, business incubators, therefore,~~ play an important role ~~because they will in assisting help~~ Indonesia ~~in resolvesolving~~ some of its economic problems ~~through by creating jobs creation and graduated firms~~.

~~W The government of Indonesia, with the~~ assistance from the Cooperative Department and universities, ~~the government of Indonesia has had~~ established the incubators in the country since 1992. This initiative was given a boost in 1997 ~~through by~~ a programme known as the Development of Entrepreneurship Culture in Universities, where activities ~~included~~ the New Entrepreneurs' Incubators (Bank Indonesia, 2006).

In addition to ~~the~~ Indonesian regulations, about business incubators, the terms of business ~~incubators~~, incubation activity, and incubation participation are governed by the Presidential Regulation number 27/2013, ~~the~~ Development of Entrepreneurial Incubators. Further, ~~in the~~ Ministry of Cooperatives and Micro, Small and Medium Enterprises ~~had~~ introduced Regulation No. 24/Per/M.KUKM/IX/2015 on Norms, Standards, Procedures, and Criteria (NSPK) of the

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Management of Entrepreneurial Incubators. This ~~that~~ regulates the administrative matters of an incubator, including registration, required standards, required services, expected output of an incubator and its tenant, and a targeted number of incubators in the country. ~~However, some of the parameters on regarding the regulation, however,~~ are unspecific, such as the employees' standards of professionalism, the provisions of sufficient facilities and infrastructure, and measurements of the incubators' success indicators.

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2.3. Business Incubator Successful Factor Development

Most problems that entrepreneurs encounter ~~in at~~ the early stages of business development are a lack of legitimacy, experience, tangible resources, and accumulated knowledge, which are success factors ~~that allow them~~ to recognize and seize business opportunities. Business incubators do not guarantee graduate tenant company. ~~However, evaluating all of the emerging cCritical sSuccess fFactors, however,~~ can minimize failures once the company enters the business incubator (Lumpkin, 1988).

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The initial framework by Campbell, Kendrick and Samuelson (1985) emerged with the simple business incubator services and facilities. The business incubator framework started with entry criteria, selection processes, funding, and mentoring-networking for tenant business growth.

Smilor (1987) introduced a non-profit business incubator framework whose model implicates the tenant business mission, such as economic development, successful products, a tenant's profit, technology diversification, and job creation. Smilor's framework involved support systems, ~~namely (i.e. administration, facilities, and business expertise, from~~ universities and the government. His ~~extensive work was probably the most extensive instrives to~~ ascertaining and elaborate ~~uponing~~ the different elements of an incubation system. Campbell (1989) introduced ~~the a~~ new incubation process model ~~that consisteding of a~~ pre-incubation process, entry criteria and selection processes ~~and~~ monitoring and controlling processes. The previous models by Campbell et al. (1985) and Smilor (1987) ~~had did~~ not introduced the processes and activities from the pre-incubation and incubation processes until successful outcomes were achieved. Mian (1997) ~~gave provided~~ more detailed processes, criteria, policies, and programmes; and ~~had~~ sought the involvement of universities, communities and other stakeholders ~~in developingfor the development of a~~ theoretical model ~~for theto evaluation~~ and management of the university-based technology business incubators' (UTBI) performance. ~~FMian for the first time, Mian~~ introduced the university involvement and developed performance criteria for technology business incubators in the public and private sectors.

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The business incubator model is ~~categorisedcategorized~~ as pre-incubation activities or input (entry criteria), incubation or process, and graduation or output (exit criteria) (Costa-David, Malan, & Lalkaka, 2002). Costa-David et al. ~~were the first to for the first time gaveoutline~~ the detailed skill requirements, ~~(such as management, finance, business advice, networking and training for start-ups until their graduation)~~. Verma's (2004) framework introduced more detailed success factors, ~~namely (i.e. shared services, facilities and location, financing and support, control of incubators, mentoring-networking, entry criteria and~~ exit criteria), as well as moderating factors, ~~such as (i.e. age and the quality of facilities for a successful business incubator framework)~~. Voisey (2006) introduced the concepts of hard (profitability, sales turnover, etc.) and soft (business skill improvement, cost saving, etc.) performance measurements of business incubator practice achievement.

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3. RESEARCH METHODOLOGY

~~All-Each of~~ the 9 success factors, 3 moderating factors and 115 indicators in this research ~~had beenwas~~ investigated in Gozali et al. (2015). ~~Tand~~ the development of a proposed initial

framework of successful business incubators in Indonesian public universities from previous business incubator's model and framework ~~has was also been explored in by~~ Gozali et al. (2016). The research was addressed using mixed methods, ~~specifically~~ (qualitative and quantitative methods). In the qualitative method, ~~the~~ literature study and expert interviews were conducted in Indonesian public university business incubators to develop the questionnaire. In the quantitative method, data collection, data calculation (reliability and validity), ~~and a~~ calculation of the business incubators' success factors' value were performed. The data were collected from March ~~through to~~ October 2016.

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3.1 Research Location

This research was conducted in Indonesia with the participation of 18 Indonesian public university business incubators, comprising Universitas Sumatera Utara, Universitas Andalas, Universitas Indonesia, Institut Pertanian Bogor, Universitas Diponegoro, Universitas Sam Ratulangi, Universitas Brawijaya, Universitas Airlangga, Institut Teknologi Sepuluh November, Universitas Riau, Universitas Udayana, Universitas Gorontalo, Universitas Sebelas Maret, Universitas Jambi, Universitas Padjajaran, Bandung Techno Park, Universitas Negeri Yogyakarta, and Institut Teknologi Bandung.

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3.2 Research Sample

The sample of this research is comprised of incubator managers in public universities in Indonesia who ~~were in charge of~~ oversaw the daily activities of the incubators and graduated tenant companies. ~~The samples were selected as the managers had the~~ required understanding and experience in incubator management as well as in handling the relationships among tenant companies within the incubators.

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This research saw the participation of 77.4% male and 22.6% female respondents ~~within~~ the age ranges of below 30 years old (3.2%), 30–39 years old (29%), 40–49 years old (19.4%), 50–59 years old (35.5%), and over 60 years old (12.9%). All the respondents were business incubator managers. The respondents' levels of education consisted of Bachelor's degrees (6.5%), Master's degrees (51.6%) and Doctorate degrees (41.9%).

4. DATA ANALYSIS AND RESULTS

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4.1 Indicator Reliability Test

~~This research employed the mixed methods approach.~~ This study employed a mixed-method research design, ~~namely~~ (quantitative and qualitative methods), which ~~uses~~ a sequential explanatory design ~~that begins starting~~ with data collection from a literature review and developing a quantitative study ~~that is supplemented~~ by data from in-depth, one-on-one interviews. The status of the quantitative aspects of the research ~~is was~~ considered higher than the qualitative ~~since because~~ the interviews with the expert were based on empirical data, which was collected first. The quantitative study continued with reliability and validity tests, research hypotheses tests, and a structural model test. ~~The research used the case study as a part of the qualitative method to~~ study examine the differences among public university business incubators in Indonesia.

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~~The data were was analyzed~~ using statistical software IBM SPSS version 23 and Smart PLS version 3. ~~The Cronbach~~ Cronbach alpha values ~~that were~~ calculated are larger than 0.6 (Hair et al., 2012). ~~A Therefore~~, all of the reflective latent variables, ~~therefore~~, have high levels of internal consistency reliability. Composite reliability ~~that was~~ calculated is larger than 0.7, ~~so~~ which confirms the composite reliability ~~is confirmed~~ (Bagozzi and Yi, 1988).

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MeanwhileFurthermore, convergent validity, such as the aAverage vVariance eExtracted (AVE) of the latent variables should exceed the acceptable threshold value of 0.5 (Bagozzi and Yi, 1988). Some indicators showed the-an unacceptable reliability test, and they were are removed from the research. The indicators that do-did not meet the threshold are-were FAC 1 (business taxes), FAC 2 (risk and management unit), FAC 7 (export development assistance), FAC 8 (writing financial report, ratio and-balances), SBSE 1 (audio visual equipment), SBSE 10 (office hour answering service), SBSE 11 (air conditioner), SBSE 12 (cleaning), SBSE 13 (maintenance), SBSE 14 (custodial service), SBSE 7 (filing), SSF 10 (logistic), SSF 5 (conference room), SSF 6 (meeting room), SSF 7 (furniture and equipment rental), SSF 8 (canteen), and SSF 9 (sShipping and receiving).

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4.2 Indicator Validity Test

4.2

According to Fornell and Larcker (1981), the square root of each latent construct's AVE could determine discriminant validity, if this value were-is greater than other correlations among the latent constructs. The square root of AVE for each construct was compared with the correlations between all pairs of latent constructs. IfThe model has enough discriminant validity if the square root of the AVE for each construct were-is larger than the correlations between all pairs of the constructs in the model, then the model has enough discriminant validity. When the square root of the AVE is greater than the correlations between the constructs, the level of validity of the constructs is considered satisfactory. As a result, eHence, each construct -was considered as having high validity. All the square roots of the AVE exceeded the correlation values between other constructs and all the square roots of latent variables in each column. Therefore, the results, therefore, showed satisfactory discriminant validity.

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4.3 Effect Size Value

4.3

The effect size was calculated to evaluate the impact of a predictor construct on an endogenous construct. Credits and rewards, entry criteria, exit criteria, and funding support had a strong effect size on the success factors. The effect sizes of funding and support to success factors, good system and infrastructure to success factors, information technology to the quality of facility and mentoring-networking to good system and infrastructure were strong. The correlation between university regulations and credits-and-rewards was strong. Table 1 and Figure 1 show the effect size of business incubator success factors.

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The sSuccess fFactors of Indonesian pPublic uUniversity bBusiness iIncubators are: (1) The aAbility of the bBusiness iIncubator, eEntry cCriteria, eExit cCriteria, fFunding and sSupport, gGovernment sSupport and pProtection, iIncubator gGovernance, mMentoring and nNetworking, sSystem iInfrastructure, and uUniversity rRegulation.

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It is necessary for kKnowledge-intensive firms need to possess the capability, competency, and the right attitudes at both individual and firm levels to convert new thinking, technologies, and creations into economic and social value by using pioneering business models (Byers et al., 2010; Mitchelmore and Rowley, 2010; Passiante and Romano, 2016).

The importance performance map analysis, as shown-presented in Figure 2, shows the strong correlations between mMentoring-nNetworking and gGood sSystem and iInfrastructure as well as, between-uUniversity rRegulations and cCredits-and-rRewards and, between iInformation tTechnology and some other services and aAge-and-qQuality fFacilities.

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Table 1. The Effect Size Business Incubator Success Factors							
	Age and Quality of Facilities	Credits and rewards	Entry Criteria	Exit Criteria	Funding Support	Good System and Infrastructure	Success Factors
Age and Quality of Facilities							0.044
Credits and Rewards	0.150						
Entry Criteria							
Exit Criteria							
Financial Accounting Consultation	0.006						
Funding Support							
Good System and Infrastructure							1.114
Government Support and Protection		0.003					
Incubator Governance		0.018					
Information Technology	0.727						
Management Human Resource and Assistance	0.280						
Marketing Assistance	0.004						
Mentoring-Networking						0.321	
Physical Logistic Facilities	0.047						
Professional Business Service and Etiquette	0.009						
Shared Business Service and Equipment	0.232						
Success Factors			1.409	1.076	1.377		
System Infrastructure						0.035	
University Regulations		0.302					

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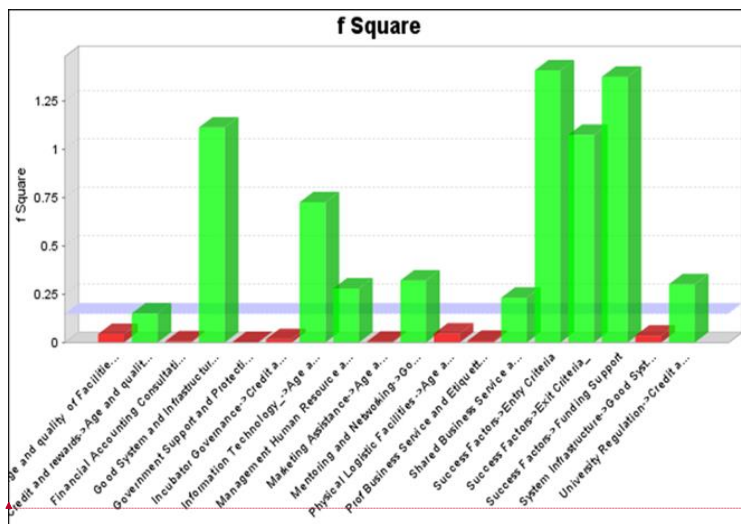


Figure 1. Effect Size of Business Incubator Success Factors.

4.4 Structural Path Coefficient

4.4

After the model was entered into the SEM software package and the analysis was conducted, the result of the fitness measures will indicated whether the research hypotheses are-were accurate or vice versa-not. The ratio of each parameter to its standard error correspondeds to a z test for the significance of the relationship; with $p = 0.05$ and a standard deviation of 1.96 (Jackson et al., 2005).

The strong effect of critical success factors and moderating factors in business incubators for Indonesian public universities are; (a) Credit and Rewards to Age and the Quality of the Facilities; (b) Information Technology to Age and the Quality of the Facilities; (c) Mentoring-n Networking to Good sSystem and iInfrastructure; (d) success factors to eEntry cCriteria, eExit cCriteria, and the fFunding supportSystem directly to Suceess Factor; and (e) the uUniversities' rRegulations to cCredits and rRewards factors (refer to Table 2).

Table 2. Structural Path Coefficient Model for this Research.

No.	Critical Success Factors	T statistics	P values
1	Age and quality- of fFacilities → Success fFactors	0.836	0.404
2	Credit and rewards → Age and quality -of fFacilities	1.513	0.131
3	Financial aAccounting cConsultation → Age and quality -of fFacilities	0.282	0.778
4	Good sSystem and iInfrastructure → Success fFactors	4.996	0.000
5	Government sSupport and pProtection → Credit and rewards	0.226	0.821
6	Incubator gGovernance → Credit and rewards	0.435	0.664
7	Information tTechnology → Age and quality -of fFacilities	2.786	0.006
8	Management hHuman rResource & aAssistance → Age and& quality	1.241	0.215
9	Marketing aAssistance → Age and quality- of fFacilities	0.136	0.892
10	Mentoring and nNetworking → Good sSystem and iInfrastructure	2.738	0.006
11	Physical lLogistic fFacilities → Age and quality -of fFacilities	0.656	0.512
12	Prof Business Service and Etiquette → Age and quality -of fFacilities	0.267	0.789

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No.	Critical Success Factors	T statistics	P values
13	Shared business service and equipment → Age and quality of	1.289	0.198
14	Success factors → Entry criteria	11.433	0.000
15	Success factors → Exit criteria	6.152	0.000
16	Success factors → Funding support	10.521	0.000
17	System infrastructure → Good system and infrastructure	0.819	0.413
18	University regulation → Credits and rewards	2.354	0.019

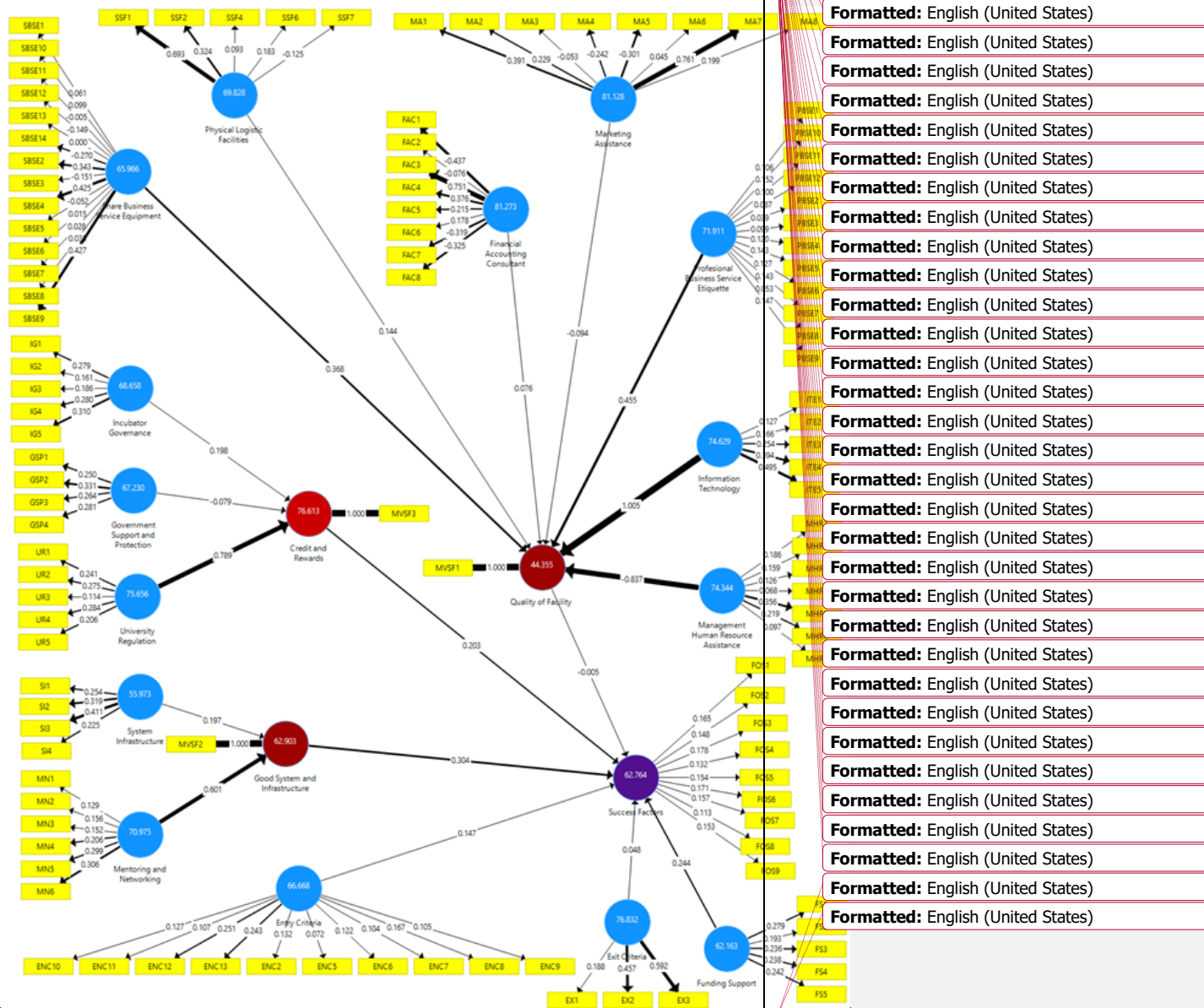


Figure 2. Importance Performance Map Analysis of the Factors of Successful Business Incubators Among Indonesian Public Universities.

5. CONCLUSION

The results of ~~the research~~this study demonstrated that ~~the~~ effect of critical success factors, ~~namely~~ entry criteria (Campbell, 1989), exit criteria (Campbell, 1989), funding support (O'Neal 2005), mentoring-networking (Agnete, 2011; Miller et. al., 2011), and university regulations (Mian 1997), directly affect the business incubators for Indonesian public universities. Furthermore, the results ~~also~~ showed that the moderating factors, ~~namely~~ credit and rewards (O'Neal, 2005), good system and infrastructure (O'Neal, 2005), and the age and quality of the facilities (Verma, 2004), significantly affect university regulations, mentoring-networking, and information technology, respectively.

A good system and infrastructure ~~showeds~~ a strong relationship with ~~the~~ success factors directly, and information technology ~~showeds~~ a strong relationship with the moderating factors, especially age and the quality of the facilities. Mentoring and networking ~~showshad~~ a strong ~~relationship-connection to with~~ the moderating factors, namely good system and infrastructure, and university regulations ~~hads~~ a strong relationship with the moderating factor of credit and rewards. It cannot be denied that entry criteria, exit criteria, and funding support ~~show~~ strong relationships directly to are associated with the success factors. This finding could improve the management of business incubators in Indonesian public universities and make them more for it to be successful. These research findings may facilitate-persuade Indonesian public university business incubators to give more attention to the development and management of the business incubators on their own.

This ~~Since the~~ study has ascertained the effect of critical success factors and moderating factors for the business incubators in Indonesian public universities. Voisey (2006) ~~utilised~~utilized business incubator measurement to manage business incubators performance, economic policymakers, and stakeholders of the importance of learning strategies. Universities' business incubator regulations and environments enable and encourage the start-ups to exchange ideas and achieve success in business creation. The entry criteria are important not only to select start-ups to implement their business ideas, but also to support business learning communities in entrepreneurship learning programs.

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CRITICAL SUCCESS AND MODERATING FACTORS EFFECT IN INDONESIAN PUBLIC UNIVERSITIES' BUSINESS INCUBATORS

ABSTRACT

This study aims to examine the effect of critical success and moderating factors in Indonesian public universities' business incubators. The study of business incubators benefits university professors in their roles as managers and advisors, university faculty entrepreneurs and start-ups/tenants in the knowledge transfer and entrepreneurship learning processes, and government officials in effective policy making. For the universities, the incubators serve as a platform for the commercialization of their research efforts. The incubators assist the universities' stakeholders in fulfilling their newly identified responsibilities towards building the nation's economy and giving the faculty members and graduate students the chance to conduct research. Regarding the economic environment, the incubators help create job opportunities, increase the country's economic value, and reduce poverty. This research employed the quantitative method approach, and the data were analyzed using the IBM SPSS version 23 and Smart PLS version 3 statistical software packages. The samples of this research were comprised of 31 business incubator managers from Indonesian public universities. Although there have been previous models about critical success and moderating factors for business incubators in other countries, this study is the first that was conducted in Indonesia and found direct and indirect relationships between critical success factors and moderating success factors for Indonesian Public University Business Incubators. The results of the research demonstrated that good system and infrastructure show a strong direct relationship with success factors and that information technology shows a strong relationship with the moderating factors, namely age and quality of facilities. Furthermore, mentoring and networking showed a strong relationship with the moderating factors good system and infrastructure and that university regulation had a strong relationship with moderating factor credit and rewards. Entry criteria, exit criteria, and funding support showed strong direct relationships to success factors. These findings could improve the management of business incubators in Indonesian Public Universities and allow them to more successful.

Keywords: Critical Success Factors; Moderating Factors; University Business Incubators; Indonesian Public Universities

1. INTRODUCTION

While the term "entrepreneurship" has various meanings, it can be defined as "the process of uncovering or developing an opportunity to create value through innovation" (Kaufmann Center, Macke and Kayne, 2001). According to Feldman (2016), research on university faculty, staff and entrepreneurial capacities may be extended and investigated in various areas of study. In the long run, business enterprises are crucial elements in determining economic success (Romer, 1994). In addition, during economic recessions, new firms play a crucial role in providing employment, proliferating inventions and driving a country's economy (Dana, 2004; Engle et al., 2010; Ahmed et al., 2010).

Researchers, policymakers, operators of business incubators and stakeholders do not have an adequate and proper method to monitor and appraise business incubators' performances in

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various business sectors and diverse geographical areas. Previous studies lack the theories, methodologies and empirical data to appraise business incubators' performance and their impact on the economy, even though they are of particular interest to academics and industry practitioners alike (Lewis, 2001; Cornelius and Bhabra-Remedios, 2003). Therefore, business incubators are expected to define their own performance measurements (Voisey, 2006).

According to the National Business Incubation Association (NBIA) (2003), an important factor in the appraisal of an incubator's performance is the service provision method, but it has not been given enough attention. There is a lack of research about how the services have been extended to the incubators. The incubators goal is to discover whether the services are provided by their managers, boards or mentors, or through internal courses or other methods.

The failure rate in the early stage of start-ups is 90% (Patel, 2015; Griffith, 2017). Data on the rates of business failures are frequently quoted (NBIA, 2003). According to the U.S. Small Business Administration, only 44% of firms stay in business four years after the commencement of operation. This is contradictory to the data gathered by the NBIA, which reports that 87% of graduate firms remained in business ten years after the commencement of operation. On account of the data of failed start-ups, it becomes necessary to identify the critical success factors of building business incubators for public universities in Indonesia. This study's objective, **therefore**, is to identify the critical success factors in those incubators. The focus of this study is on the activities of Indonesian public universities' business incubators, especially the capabilities and the activities of 31 business incubator managers.

Indonesia's fast growing middle-class market is a fertile ground for start-up enterprises, both local and foreign. This trend presents promising prospects across various industries, including technology, communication, creative and social enterprises. Nurturing a resilient business sector will result in the creation of new jobs and more business prospects across industries, which makes it critical for the economic **growth** of developing countries (Singtel, 2017).

There is no previous research that addresses the effect of critical success and moderating factors towards a business incubator's success, especially among Indonesian public university business incubators. The main purpose of this research is to identify the direct and indirect relationships between critical success factors and moderating success factors for Indonesian public university business incubators.

A well-known cultural issue, **however**, is that Indonesians are less **likely** to initiate their own business ventures. According to a study by the Global Entrepreneurship Monitor, 14.5% of Americans and 7.2% of Singaporeans are keen to start up their own **businesses**. These statistics stand in **stark** contrast to the less than one percent of Indonesians who are willing to do the same (Frazier, 2012).

2. LITERATURE REVIEW

2.1. University Business **Incubators**

The clients of the University of Central Florida's Business Incubation Program receive **extensive** benefits regarding business, technology and entrepreneurial support (O'Neal, 2005). The incubator is emphasized **as one of the several critical success factors** that will ensure a **client's** success by: (1) incorporating clients into a larger technology development system; (2) encouraging interaction among **clients**, incubator management and its employees, external parties and the incubator's advisory panel; and (3) giving access to external financing, university resources, economic development agencies in the local community/government and other business support **organizations**.

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Currently, there is a higher degree of support from the university incubators for small firms in the latter's quest for long-term viability and development that involves networking among the entrepreneurs. Several previous studies have investigated the importance of networking for entrepreneurs in detail, and they emphasize the steps towards developing and maintaining relationships within the business setting (Aldrich & Zimmer, 1986; Shaw & Conway, 2000; Hoang & Antoncic, 2003; Neergaard, 2005). Among the advantages offered by the incubator are networks and cooperation, and many businesses would be keen to collaborate with the best of them if they were given the opportunity (Ageton, 2011). Therefore, according to Miller et al. (2011), more attention ought to be given to keeping and preserving knowledge because it would assist in the universities' technology transfer processes, especially on account of the fleeting nature of spin out companies evolving through the process.

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2.2. Regulation of Business Incubators in Indonesian Universities

To improve the well-being of the country's citizens, it is necessary for the government to tackle a major challenge, namely unemployment. The Central Bureau of Statistics (CBS) of Indonesia revealed that 5.33% of Indonesia's workforce were unemployed and 11.5% of the population were below the poverty line in 2017. In support of the government's program to alleviate poverty, entrepreneurship projects at public universities are expected to help provide employment, which will also reduce the number of poor people.

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In September 2017, the Federal Open Market Committee (FOMC) reported that the normal unemployment rate should be between 4.4% and 5% with a median value of 4.6%. Regrettably, 5.33%, or 7.02 million of Indonesia's population, were unemployed (CBS, 2017). Additionally, 2.07%, or 3.4 million of the country's population, were illiterate (Ministry of Education and Culture, 2017). To make matters worse, uneducated people are often used in demonstrations in Indonesia. These people are in dire need of jobs that can help improve their economic and financial conditions. Business incubators, therefore, play an important role because they will help Indonesia resolve some of its economic problems by creating jobs and graduated firms.

With assistance from the Cooperative Department and universities, the government of Indonesia has established the incubators in the country since 1992. This initiative was given a boost in 1997 by a program known as the Development of Entrepreneurship Culture in Universities, where activities included the New Entrepreneurs' Incubators (Bank Indonesia, 2006).

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In addition to Indonesian regulations about business incubators, the terms of business incubators, incubation activity, and incubation participation are governed by the Presidential Regulation number 27/2013, the Development of Entrepreneurial Incubators. Further, in the Ministry of Cooperatives and Micro, Small and Medium Enterprises had introduced Regulation No. 24/Per/M.KUKM/IX/2015 on Norms, Standards, Procedures, and Criteria (NSPK) of the Management of Entrepreneurial Incubators. This regulates the administrative matters of an incubator, including registration, required standards, required services, expected output of an incubator and its tenant and a targeted number of incubators in the country. Some of the parameters regarding the regulation, however, are unspecific, such as the employees' standards of professionalism, the provisions of sufficient facilities and infrastructure and measurements of the incubators' success indicators.

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2.3. Business Incubator Successful Factor Development

Most problems that entrepreneurs encounter at the early stages of business development are a lack of legitimacy, experience, tangible resources and accumulated knowledge, which are

success factors that allow them to recognize and seize business opportunities. Business incubators do not guarantee graduate tenant company. Evaluating all of the emerging critical success factors, however, can minimize failures once the company enters the business incubator (Lumpkin, 1988).

The initial framework by Campbell, Kendrick and Samuelson (1985) emerged with the simple business incubator services and facilities. The business incubator framework started with entry criteria, selection processes, funding and mentoring-networking for tenant business growth.

Smilor (1987) introduced a non-profit business incubator framework whose model implicates the tenant business mission, such as economic development, successful products, a tenant's profit, technology diversification and job creation. Smilor's framework involved support systems, namely administration, facilities and business expertise, from universities and the government. His extensive work strives to ascertain and elaborate upon the different elements of an incubation system. Campbell (1989) introduced a new incubation process model that consisted of a pre-incubation process, entry criteria and selection processes and monitoring and controlling processes. The previous models by Campbell et al. (1985) and Smilor (1987) did not introduce the processes and activities from the pre-incubation and incubation processes until successful outcomes were achieved. Mian (1997) provided more detailed processes, criteria, policies and programs and sought the involvement of universities, communities and other stakeholders for the development of a theoretical model to evaluate and manage the university-based technology business incubators' (UTBI) performance. For the first time, Mian introduced the university involvement and developed performance criteria for technology business incubators in the public and private sectors.

The business incubator model is categorized as pre-incubation activities or input (entry criteria), incubation or process and graduation or output (exit criteria) (Costa-David, Malan, & Lalkaka, 2002). Costa-David et al. were the first to outline the detailed skill requirements, such as management, finance, business advice, networking and training for start-ups until their graduation. Verma's (2004) framework introduced more detailed success factors, namely shared services, facilities and location, financing and support, control of incubators, mentoring-networking, entry criteria and exit criteria, as well as moderating factors, such as age and the quality of facilities for a successful business incubator framework. Voisey (2006) introduced the concepts of hard (profitability, sales turnover, etc.) and soft (business skill improvement, cost saving, etc.) performance measurements of business incubator practice achievement.

3. RESEARCH METHODOLOGY

Each of the 9 success factors, 3 moderating factors and 115 indicators in this research was investigated in Gozali et al. (2015). The development of a proposed initial framework of successful business incubators in Indonesian public universities from previous business incubator's model and framework was also explored by Gozali et al. (2016). The research was addressed using mixed methods, specifically qualitative and quantitative methods. In the qualitative method, the literature study and expert interviews were conducted in Indonesian public university business incubators to develop the questionnaire. In the quantitative method, data collection, data calculation (reliability and validity) and a calculation of the business incubators' success factors' value were performed. The data were collected from March to October 2016.

3.1 Research Location

This research was conducted in Indonesia with the participation of 18 Indonesian public university business incubators, comprising Universitas Sumatera Utara, Universitas Andalas,

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Universitas Indonesia, Institut Pertanian Bogor, Universitas Diponegoro, Universitas Sam Ratulangi, Universitas Brawijaya, Universitas Airlangga, Institut Teknologi Sepuluh Nopember, Universitas Riau, Universitas Udayana, Universitas Gorontalo, Universitas Sebelas Maret, Universitas Jambi, Universitas Padjajaran, Bandung Techno Park, Universitas Negeri Yogyakarta and Institut Teknologi Bandung.

3.2 Research Sample

The sample of this research is comprised of incubator managers in public universities in Indonesia who oversaw the daily activities of the incubators and graduated tenant companies. The samples were selected as the managers had the required understanding and experience in incubator management as well as in handling the relationships among tenant companies within the incubators.

This research saw the participation of 77.4% male and 22.6% female respondents in the age ranges of below 30 years old (3.2%), 30–39 years old (29%), 40–49 years old (19.4%), 50–59 years old (35.5%) and over 60 years old (12.9%). All the respondents were business incubator managers. The respondents' levels of education consisted of Bachelor's degrees (6.5%), Master's degrees (51.6%) and Doctorate degrees (41.9%).

4. DATA ANALYSIS AND RESULTS

4.1 Indicator Reliability Test

This study employed a mixed-method research design, namely quantitative and qualitative methods, which uses a sequential explanatory design that begins with data collection from a literature review and develops a quantitative study that is supplemented by data from in-depth, one-on-one interviews. The status of the quantitative aspects of the research was considered higher than the qualitative because the interviews with the expert were based on empirical data, which was collected first. The quantitative study continued with reliability and validity tests, research hypotheses tests and a structural model test. The research used the case study as a part of the qualitative method to examine the differences among public university business incubators in Indonesia.

The data was analyzed using statistical software IBM SPSS version 23 and Smart PLS version 3. The Cronbach alpha values that were calculated are larger than 0.6 (Hair et al., 2012). All of the reflective latent variables, therefore, have high levels of internal consistency reliability. Composite reliability that was calculated is larger than 0.7, which confirms the composite reliability (Bagozzi and Yi, 1988). Furthermore, convergent validity, such as the average variance extracted (AVE) of the latent variables should exceed the acceptable threshold value of 0.5 (Bagozzi and Yi, 1988). Some indicators showed an unacceptable reliability test and they were removed from the research. The indicators that did not meet the threshold were FAC 1 (business taxes), FAC 2 (risk and management unit), FAC 7 (export development assistance), FAC 8 (writing financial report, ratio and balances), SBSE 1 (audio visual equipment), SBSE 10 (office hour answering service), SBSE 11 (air conditioner), SBSE 12 (cleaning), SBSE 13 (maintenance), SBSE 14 (custodial service), SBSE 7 (filing), SSF 10 (logistic), SSF 5 (conference room), SSF 6 (meeting room), SSF 7 (furniture and equipment rental), SSF 8 (canteen) and SSF 9 (shipping and receiving).

4.2 Indicator Validity Test

According to Fornell and Larcker (1981), the square root of each latent construct's AVE could determine discriminant validity, if this value is greater than other correlations among the latent

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constructs. The square root of AVE for each construct was compared with the correlations between all pairs of latent constructs. If the square root of the AVE for each construct is larger than the correlations between all pairs of the constructs in the model, then the model has enough discriminant validity. When the square root of the AVE is greater than the correlations between the constructs, the level of validity of the constructs is considered satisfactory. As a result, each construct was considered as having high validity. All the square roots of the AVE exceeded the correlation values between other constructs and all the square roots of latent variables in each column. The results, therefore, showed satisfactory discriminant validity.

4.3 Effect Size Value

The effect size was calculated to evaluate the impact of a predictor construct on an endogenous construct. Credits and rewards, entry criteria, exit criteria and funding support had a strong effect size on the success factors. The effect sizes of funding and support to success factors, good system and infrastructure to success factors, information technology to the quality of facility and mentoring-networking to good system and infrastructure were strong. The correlation between university regulations and credits-and-rewards was strong. Table 1 and Figure 1 show the effect size of business incubator success factors.

The success factors of Indonesian public university business incubators are: the ability of the business incubator, entry criteria, exit criteria, funding and support, government support and protection, incubator governance, mentoring and networking, system infrastructure and university regulation.

It is necessary for knowledge-intensive firms to possess the capability, competency and the right attitudes at both individual and firm levels to convert new thinking, technologies and creations into economic and social value by using pioneering business models (Byers et al., 2010; Mitchelmore and Rowley, 2010; Passiante and Romano, 2016).

The importance performance map analysis, as presented in Figure 2, shows the strong correlations between mentoring-networking and good system and infrastructure as well as university regulations and credits-and-rewards and between information technology and other services and age-and-quality facilities.

Table 1. The Effect Size Business Incubator Success Factors.

	Age and Quality of Facilities	Credits and rewards	Entry Criteria	Exit Criteria	Funding Support	Good System and Infrastructure	Success Factors
Age and Quality of Facilities							0.044
Credits and Rewards	0.150						
Entry Criteria							
Exit Criteria							
Financial Accounting Consultation	0.006						
Funding Support							
Good System and Infrastructure							1.114
Government Support and Protection		0.003					
Incubator Governance		0.018					

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	Age and Quality of Facilities	Credits and rewards	Entry Criteria	Exit Criteria	Funding Support	Good System and Infrastructure	Success Factors
Information Technology	0.727						
Management Human Resource and Assistance	0.280						
Marketing Assistance	0.004						
Mentoring-Networking						0.321	
Physical Logistic Facilities	0.047						
Professional Business Service and Etiquette	0.009						
Shared Business Service and Equipment	0.232						
Success Factors			1.409	1.076	1.377		
System Infrastructure						0.035	
University Regulations		0.302					

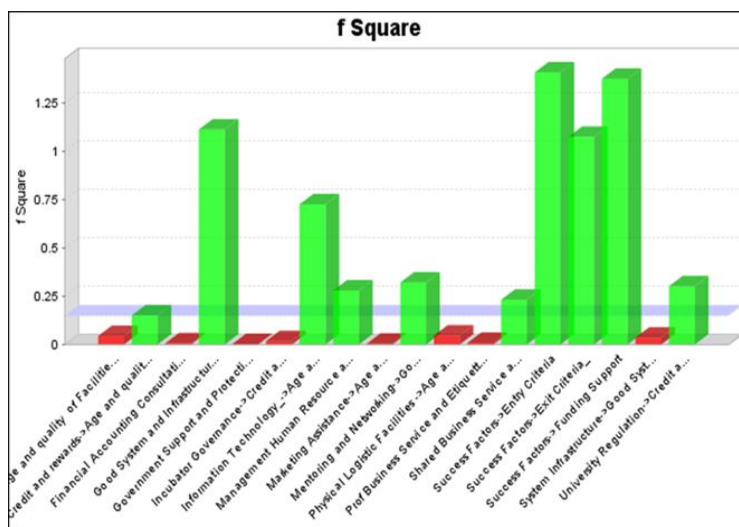


Figure 1. Effect Size of Business Incubator Success Factors.

4.4 Structural Path Coefficient

After the model was entered into the SEM software package and the analysis was conducted, the result of the fitness measures indicated whether the research hypotheses were accurate or not. The ratio of each parameter to its standard error corresponded to a z test for the significance of the relationship with $p = 0.05$ and a standard deviation of 1.96 (Jackson et al., 2005).

The strong effect of critical success factors and moderating factors in business incubators for Indonesian public universities are: (a) credit and rewards to age and the quality of the facilities; (b) information technology to age and the quality of the facilities; (c) mentoring-networking to

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good system and infrastructure; (d) success factors to entry criteria, exit criteria, and the funding support; and (e) the universities' regulations to credits and rewards factors (refer to Table 2).

Table 2. Structural Path Coefficient Model for this Research.

No.	Critical Success Factors	T statistics	P values
1	Age and quality of facilities → Success factors	0.836	0.404
2	Credit and rewards → Age and quality of facilities	1.513	0.131
3	Financial accounting consultation → Age and quality of facilities	0.282	0.778
4	Good system and infrastructure → Success factors	4.996	0.000
5	Government support and protection → Credit and rewards	0.226	0.821
6	Incubator governance → Credit and rewards	0.435	0.664
7	Information technology → Age and quality of facilities	2.786	0.006
8	Management human resource & assistance → Age and quality facilities	1.241	0.215
9	Marketing assistance → Age and quality of facilities	0.136	0.892
10	Mentoring and networking → Good system and infrastructure	2.738	0.006
11	Physical logistic facilities → Age and quality of facilities	0.656	0.512
12	Prof Business Service and Etiquette → Age and quality of facilities	0.267	0.789
13	Shared business service and equipment → Age and quality of facilities	1.289	0.198
14	Success factors → Entry criteria	11.433	0.000
15	Success factors → Exit criteria	6.152	0.000
16	Success factors → Funding support	10.521	0.000
17	System infrastructure → Good system and infrastructure	0.819	0.413
18	University regulation → Credits and rewards	2.354	0.019

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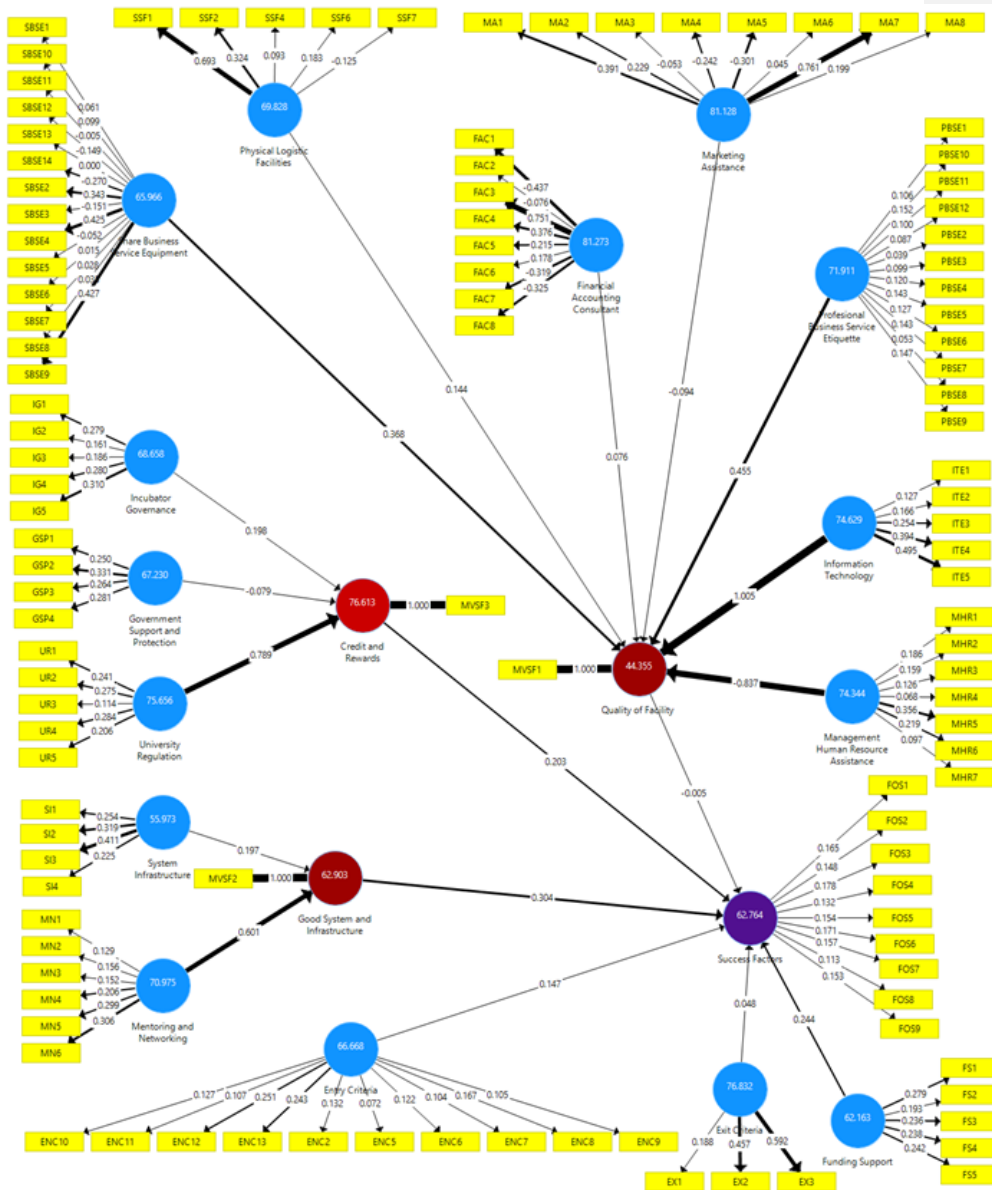


Figure 2. Importance Performance Map Analysis of the Factors of Successful Business Incubators Among Indonesian Public Universities.

5. CONCLUSION

The results of this study demonstrated that the effect of critical success factors, namely entry criteria (Campbell, 1989), exit criteria (Campbell, 1989), funding support (O'Neal 2005), mentoring-networking (Agnete, 2011; Miller et al., 2011) and university regulations (Mian 1997), directly affect the business incubators for Indonesian public universities. Furthermore, the results showed that the moderating factors, namely credit and rewards (O'Neal, 2005), good system and infrastructure (O'Neal, 2005) and the age and quality of the facilities (Verma, 2004), significantly affect university regulations, mentoring-networking and information technology, respectively.

A good system and infrastructure showed a strong relationship with the success factors, and information technology showed a strong relationship with the moderating factors, especially age and the quality of the facilities. Mentoring and networking had a strong connection to the moderating factors, namely good system and infrastructure, and university regulations had a strong relationship with the moderating factor of credit and rewards. It cannot be denied that entry criteria, exit criteria and funding support are associated with the success factors. This finding could improve the management of business incubators in Indonesian public universities and make them more successful. These research findings may persuade Indonesian public university business incubators to give more attention to the development and management of the business incubators on their own.

This study has ascertained the effect of critical success factors and moderating factors for the business incubators in Indonesian public universities. Voisey (2006) utilized business incubator measurement to manage business incubators performance, economic policymakers and stakeholders of the importance of learning strategies. Universities' business incubator regulations and environments enable and encourage the start-ups to exchange ideas and achieve success in business creation. The entry criteria are important not only to select start-ups to implement their business ideas, but also to support business learning communities in entrepreneurship learning programs.

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CRITICAL SUCCESS AND MODERATING FACTORS EFFECT IN INDONESIAN PUBLIC UNIVERSITIES' BUSINESS INCUBATORS

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ABSTRACT

This study aims to examine the effect of critical success and moderating factors in Indonesian public universities' business incubators. The study of business incubators benefits university professors in their roles as managers and advisors, university faculty entrepreneurs and start-ups/tenants in the knowledge transfer and entrepreneurship learning processes, and government officials in effective policy making. For the universities, the incubators serve as a platform for the commercialization of their research efforts. The incubators assist the universities' stakeholders in fulfilling their newly identified responsibilities towards building the nation's economy and giving the faculty members and graduate students the chance to conduct research. Regarding the economic environment, the incubators help create job opportunities, increase the country's economic value, and reduce poverty. This research employed the quantitative method approach, and the data were analyzed using the IBM SPSS version 23 and Smart PLS version 3 statistical software packages. The samples of this research were comprised of 31 business incubator managers from Indonesian public universities. Although there have been previous models about critical success and moderating factors for business incubators in other countries, this study is the first that was conducted in Indonesia and found direct and indirect relationships between critical success factors and moderating success factors for Indonesian Public University Business Incubators. The results of the research demonstrated that good system and infrastructure showed a strong direct relationship with success factors and that information technology showed a strong relationship with the moderating factors, namely age and quality of

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facilities. Furthermore, mentoring and networking showed a strong relationship with the moderating factors good system and infrastructure and that university regulation had a strong relationship with moderating factor credit and rewards. Entry criteria, exit criteria, and funding support showed strong direct relationships to success factors. These findings could improve the management of business incubators in Indonesian Public Universities and allow them to more successful.

Keywords: Critical success factors; Indonesian public universities; Moderating factors; University business incubators

1. INTRODUCTION

While the term “entrepreneurship” has various meanings, it can be defined as “the process of uncovering or developing an opportunity to create value through innovation” (Macke & Kayne, 2001). According to Feldmann (2014), research on university faculty, staff and entrepreneurial capacities may be extended and investigated in various areas of study. In the long run, business enterprises are crucial elements in determining economic success (Romer, 1994). In addition, during economic recessions, new firms play a crucial role in providing employment, proliferating inventions and driving a country's economy (Dana, 2004; Engle et al., 2010; Ahmed et al., 2010).

Researchers, policymakers, operators of business incubators and stakeholders do not have an adequate and proper method to monitor and appraise business incubators' performances in various business sectors and diverse geographical areas. Previous studies lack the theories, methodologies and empirical data to appraise business incubators' performance and their impact on the economy, even though they are of particular interest to academics and industry practitioners alike (Lewis, 2001; Cornelius & Bhabra-Remedios, 2003). Therefore, business incubators are expected to define their own performance measurements (Voisey, 2006).

According to the National Business Incubation Association (NBIA) (2003), an important factor in the appraisal of an incubator's performance is the service provision method, but it has not been given enough attention. There is a lack of research about how the services have been extended to the incubators. The incubators goal is to discover whether the services are provided by their managers, boards or mentors, or through internal courses or other methods.

The failure rate in the early stage of start-ups is 90% (Griffith, 2014; Patel, 2015). Data on the rates of business failures are frequently quoted (NBIA, 2003). According to the U.S. Small Business Administration, only 44% of firms stay in business four years after the commencement of operation. This is contradictory to the data gathered by the NBIA, which reports that 87% of graduate firms remained in business ten years after the commencement of operation. On account of the data of failed start-ups, it becomes necessary to identify the critical success factors of building business incubators for public universities in Indonesia. This study's objective is to identify the critical success factors in those incubators. The focus of this study is on the activities of Indonesian public universities' business incubators, especially the capabilities and the activities of 31 business incubator managers.

Indonesia's fast growing middle-class market is a fertile ground for start-up enterprises, both local and foreign. This trend presents promising prospects across various industries, including technology, communication, creative and social enterprises. Nurturing a resilient business sector will result in the creation of new jobs and more business prospects across industries, which makes it critical for the economic growth of developing countries (Singtel, 2017).

There is no previous research that addresses the effect of critical success and moderating factors towards a business incubator's success, especially among Indonesian public university business incubators. The main purpose of this research is to identify the direct and indirect relationships between critical success factors and moderating success factors for Indonesian public university business incubators.

A well-known cultural issue is that Indonesians are less initiates their own business ventures. According to a study by the Global Entrepreneurship Monitor, 14.5% of Americans and 7.2% of Singaporeans are keen to start up their own businesses. These statistics stand in contrast to the less than one percent of Indonesians who are willing to do the same (Frazier, 2012).

2. LITERATURE REVIEW

2.1. University Business Incubators

The clients of the University of Central Florida's Business Incubation Program receive extensive benefits regarding business, technology and entrepreneurial support (O'Neal, 2005). The incubator is emphasized the several critical success factors that will ensure a client's success by: (1) incorporating clients into a larger technology development system; (2) encouraging interaction among clients, incubator management and its employees, external parties and the incubator's advisory panel; and (3) giving access to external financing, university resources, economic development agencies in the local community/government and other business support organizations.

Currently, there is a higher degree of support from the university incubators for small firms in the latter's quest for long-term viability and development that involves networking among the entrepreneurs. Several previous studies have investigated the importance of networking for entrepreneurs in detail, and they emphasize the steps towards developing and maintaining relationships within the business setting (Aldrich & Zimmer, 1986; Shaw & Conway, 2000; Hoang & Antoncic, 2003; Neergaard, 2005). Among the advantages offered by the incubator are networks and cooperation, and many businesses would be keen to collaborate with the best of them if they were given the opportunity (Agnete Alsos et al., 2011). Therefore, according to Miller et al. (2011), more attention ought to be given to keeping and preserving knowledge because it would assist in the universities' technology transfer processes, especially on account of the fleeting nature of spin out companies evolving through the process.

2.2. Regulation of Business Incubators in Indonesian Universities

To improve the well-being of Indonesia's citizens, it is necessary for the government to resolve a major challenge, namely unemployment. The Central Bureau of Statistics (CBS) of Indonesia revealed that 5.33% of Indonesia's workforce were unemployed and 11.5% of the population were below the poverty line in 2017. In support of the government's program to alleviate poverty, entrepreneurship projects at public universities are expected to help provide employment, which will also reduce the number of poor people.

In September 2017, the Federal Open Market Committee (FOMC) reported that the normal unemployment rate should be between 4.4% and 5% with a median value of 4.6%. Regrettably, 5.33%, or 7.02 million of Indonesia's population, were unemployed (CBS, 2017). Additionally, 2.07%, or 3.4 million of the country's population, were illiterate (Ministry of Education and Culture, 2017). To make matters worse, uneducated people are often used in demonstrations in Indonesia. These people are in dire need of jobs that can help improve their economic and financial conditions. Business incubators, therefore, play an important role because they will help Indonesia resolve some of its economic problems by creating jobs and graduated firms.

With assistance from the Cooperative Department and universities, the government of Indonesia has established the incubators in the country since 1992. This initiative was given a boost in 1997 by a program known as the Development of Entrepreneurship Culture in Universities, where activities included the New Entrepreneurs' Incubators (Bank Indonesia, 2006).

In addition to Indonesian regulations about business incubators, the terms of business incubators, incubation activity, and incubation participation are governed by the Presidential Regulation number 27/2013, the Development of Entrepreneurial Incubators. Further, in the Ministry of Cooperatives and Micro, Small and Medium Enterprises had introduced Regulation No. 24/Per/M.KUKM/IX/2015 on Norms, Standards, Procedures, and Criteria (NSPK) of the Management of Entrepreneurial Incubators. This regulates the administrative matters of an incubator, including registration, required standards, required services, expected output of an incubator and its tenant and a targeted number of incubators in the country. Some of the parameters regarding the regulation, however, are unspecific, such as the employees' standards of professionalism, the provisions of sufficient facilities and infrastructure and measurements of the incubators' success indicators.

2.3. Business Incubator Successful Factor Development

Most problems that entrepreneurs encounter at the early stages of business development are a lack of legitimacy, experience, tangible resources and accumulated knowledge, which are success factors that allow them to recognize and seize business opportunities. Business incubators do not guarantee graduate tenant company. Evaluating all of the emerging critical success factors, however, can minimize failures once the company enters the business incubator (Lumpkin & Ireland, 1988).

The initial framework by Campbell et al. (1985) emerged with the simple business incubator services and facilities. The business incubator framework started with entry criteria, selection processes, funding and mentoring-networking for tenant business growth.

Smilor (1987) introduced a non-profit business incubator framework whose model implicates the tenant business mission, such as economic development, successful products, a tenant's profit, technology diversification and job creation. Smilor's framework involved support systems, namely administration, facilities and business expertise, from universities and the government. His extensive work strives to ascertain and elaborate upon the different elements of an incubation system. Berge et al. (1989) introduced a new incubation process model that consisted of a pre-incubation process, entry criteria and selection processes and monitoring and controlling processes. The previous models by Campbell et al. (1985) and Smilor (1987) did not introduce the processes and activities from the pre-incubation and incubation processes until successful outcomes were achieved. Mian (1997) provided more detailed processes, criteria, policies and programs and sought the involvement of universities, communities and other stakeholders for the development of a theoretical model to evaluate and manage the university-based technology business incubators' (UTBI) performance. For the first time, Mian introduced the university involvement and developed performance criteria for technology business incubators in the public and private sectors.

The business incubator model is categorized as pre-incubation activities or input (entry criteria), incubation or process and graduation or output (exit criteria) (Costa-David et al., 2002). Costa-David et al. were the first to outline the detailed skill requirements, such as management, finance, business advice, networking and training for start-ups until their graduation. Verman (2004) framework introduced more detailed success factors, namely shared services, facilities and location, financing and support, control of incubators, mentoring-networking, entry criteria and exit criteria, as well as moderating factors, such as age and the quality of facilities for a

successful business incubator framework. Voisey et al. (2006) introduced the concepts of hard (profitability, sales turnover, etc.) and soft (business skill improvement, cost saving, etc.) performance measurements of business incubator practice achievement.

3. RESULTS AND DISCUSSION

Each of the 9 success factors, 3 moderating factors and 115 indicators in this research was investigated in Gozali et al. (2015). The development of a proposed initial framework of successful business incubators in Indonesian public universities from previous business incubator's model and framework was also explored by Gozali et al. (2016). The research was addressed using mixed methods, specifically qualitative and quantitative methods. In the qualitative method, the literature study and expert interviews were conducted in Indonesian public university business incubators to develop the questionnaire. In the quantitative method, data collection, data calculation (reliability and validity) and a calculation of the business incubators' success factors' value were performed. The data were collected from March to October 2016.

3.1. Research Location

This research was conducted in Indonesia with the participation of 18 Indonesian public university business incubators, comprising Universitas Sumatera Utara, Universitas Andalas, Universitas Indonesia, Institut Pertanian Bogor, Universitas Diponegoro, Universitas Sam Ratulangi, Universitas Brawijaya, Universitas Airlangga, Institut Teknologi Sepuluh Nopember, Universitas Riau, Universitas Udayana, Universitas Gorontalo, Universitas Sebelas Maret, Universitas Jambi, Universitas Padjajaran, Bandung Techno Park, Universitas Negeri Yogyakarta and Institut Teknologi Bandung.

3.2. Research Sample

The sample of this research is comprised of incubator managers in public universities in Indonesia who oversaw the daily activities of the incubators and graduated tenant companies. The samples consisted of managers had the required understanding and experience in incubator management as well as in handling the relationships among tenant companies within the incubators.

This research saw the participation of 77.4% male and 22.6% female respondents in the age ranges of below 30 years old (3.2%), 30–39 years old (29%), 40–49 years old (19.4%), 50–59 years old (35.5%) and over 60 years old (12.9%). All the respondents were business incubator managers. The respondents' levels of education consisted of Bachelor's degrees (6.5%), Master's degrees (51.6%) and Doctorate degrees (41.9%).

4. DATA ANALYSIS AND RESULTS

4.1. Indicator Reliability Test

This study employed a mixed-method research design, namely quantitative and qualitative methods, which uses a sequential explanatory design that begins with data collection from a literature review and develops a quantitative study that is supplemented by data from in-depth, one-on-one interviews. The status of the quantitative aspects of the research was considered higher than the qualitative because the interviews with the expert were based on empirical data, which was collected first. The quantitative study continued with reliability and validity tests, research hypotheses tests and a structural model test. This research used the case study as a part of the qualitative method to examine the differences among public university business incubators in Indonesia.

The data was analyzed using statistical software IBM SPSS version 23 and Smart PLS version 3. The Cronbach alpha values that were calculated are larger than 0.6 (Hair et al., 2012). All of the reflective latent variables, therefore, have high levels of internal consistency reliability. Composite reliability that was calculated is larger than 0.7, which confirms the composite reliability (Bagozzi & Yi, 1988). Furthermore, convergent validity, such as the average variance extracted (AVE) of the latent variables should exceed the acceptable threshold value of 0.5 (Bagozzi & Yi, 1988). Some indicators showed an unacceptable reliability test and they were removed from the research. The indicators that did not meet the threshold were FAC 1 (business taxes), FAC 2 (risk and management unit), FAC 7 (export development assistance), FAC 8 (writing financial report, ratio and balances), SBSE 1 (audio visual equipment), SBSE 10 (office hour answering service), SBSE 11 (air conditioner), SBSE 12 (cleaning), SBSE 13 (maintenance), SBSE 14 (custodial service), SBSE 7 (filing), SSF 10 (logistic), SSF 5 (conference room), SSF 6 (meeting room), SSF 7 (furniture and equipment rental), SSF 8 (canteen) and SSF 9 (shipping and receiving).

4.2. Indicator Validity Test

According to Fornell and Larcker (1981), the square root of each latent construct's AVE could determine discriminant validity, if this value is greater than other correlations among the latent constructs. The square root of AVE for each construct was compared with the correlations between all pairs of latent constructs. If the square root of the AVE for each construct is larger than the correlations between all pairs of the constructs in the model, then the model has enough discriminant validity. When the square root of the AVE is greater than the correlations between the constructs, the level of validity of the constructs is considered satisfactory. As a result, each construct was considered as having high validity. All the square roots of the AVE exceeded the correlation values between other constructs and all the square roots of latent variables in each column. The results, therefore, showed satisfactory discriminant validity.

4.3. Effect Size Value

The effect size was calculated to evaluate the impact of a predictor construct on an endogenous construct. Credits and rewards, entry criteria, exit criteria and funding support had a strong effect size on the success factors. The effect sizes of funding and support to success factors, good system and infrastructure to success factors, information technology to the quality of facility and mentoring-networking to good system and infrastructure were strong. The correlation between university regulations and credits-and-rewards was strong. Table 1 and Figure 1 show the effect size of business incubator success factors.

The success factors of Indonesian public university business incubators are: the ability of the business incubator, entry criteria, exit criteria, funding and support, government support and protection, incubator governance, mentoring and networking, system infrastructure and university regulation.

It is necessary for knowledge-intensive firms to possess the capability, competency and the right attitudes at both individual and firm levels to convert new thinking, technologies and creations into economic and social value by using pioneering business models (Byers et al., 2010; Mitchelmore & Rowley, 2010; Romano et al., 2014).

The importance performance map analysis, as presented in Figure 2, shows the strong correlations between mentoring-networking and good system and infrastructure as well as university regulations and credits-and-rewards and between information technology and other services and age-and-quality facilities.

Table 1 The effect size business incubator success factors

	Age and Quality of Facilities	Credits and rewards	Entry Criteria	Exit Criteria	Funding Support	Good System and Infrastructure	Success Factors
Age and Quality of Facilities							0.044
Credits and Rewards	0.150						
Entry Criteria							
Exit Criteria							
Financial Accounting Consultation	0.006						
Funding Support							
Good System and Infrastructure							1.114
Government Support and Protection		0.003					
Incubator Governance		0.018					
Information Technology	0.727						
Management Human Resource and Assistance	0.280						
Marketing Assistance	0.004						
Mentoring-Networking						0.321	
Physical Logistic Facilities	0.047						
Professional Business Service and Etiquette	0.009						
Shared Business Service and Equipment	0.232						
Success Factors			1.409	1.076	1.377		
System Infrastructure						0.035	
University Regulations		0.302					

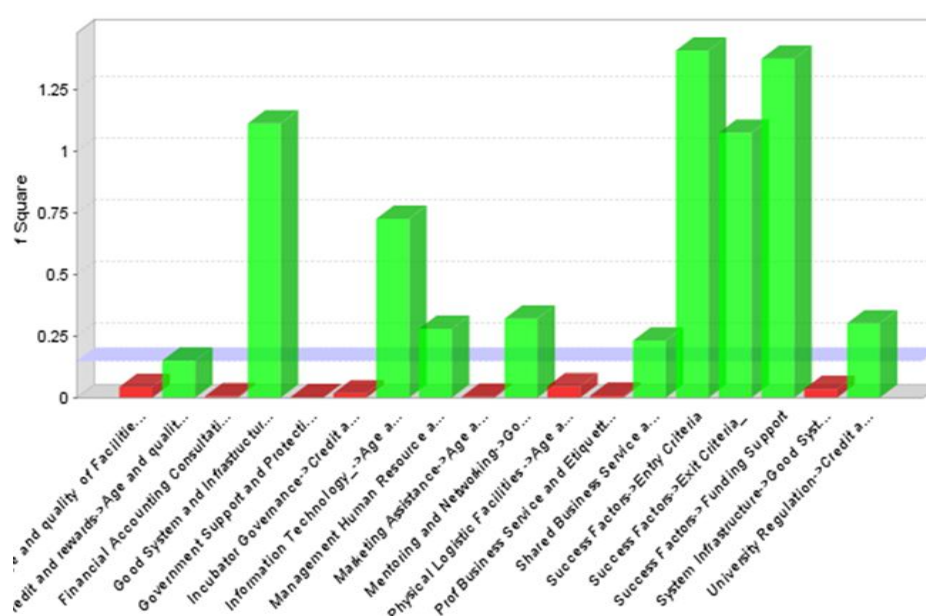


Figure 1 Effect size of business incubator success factors

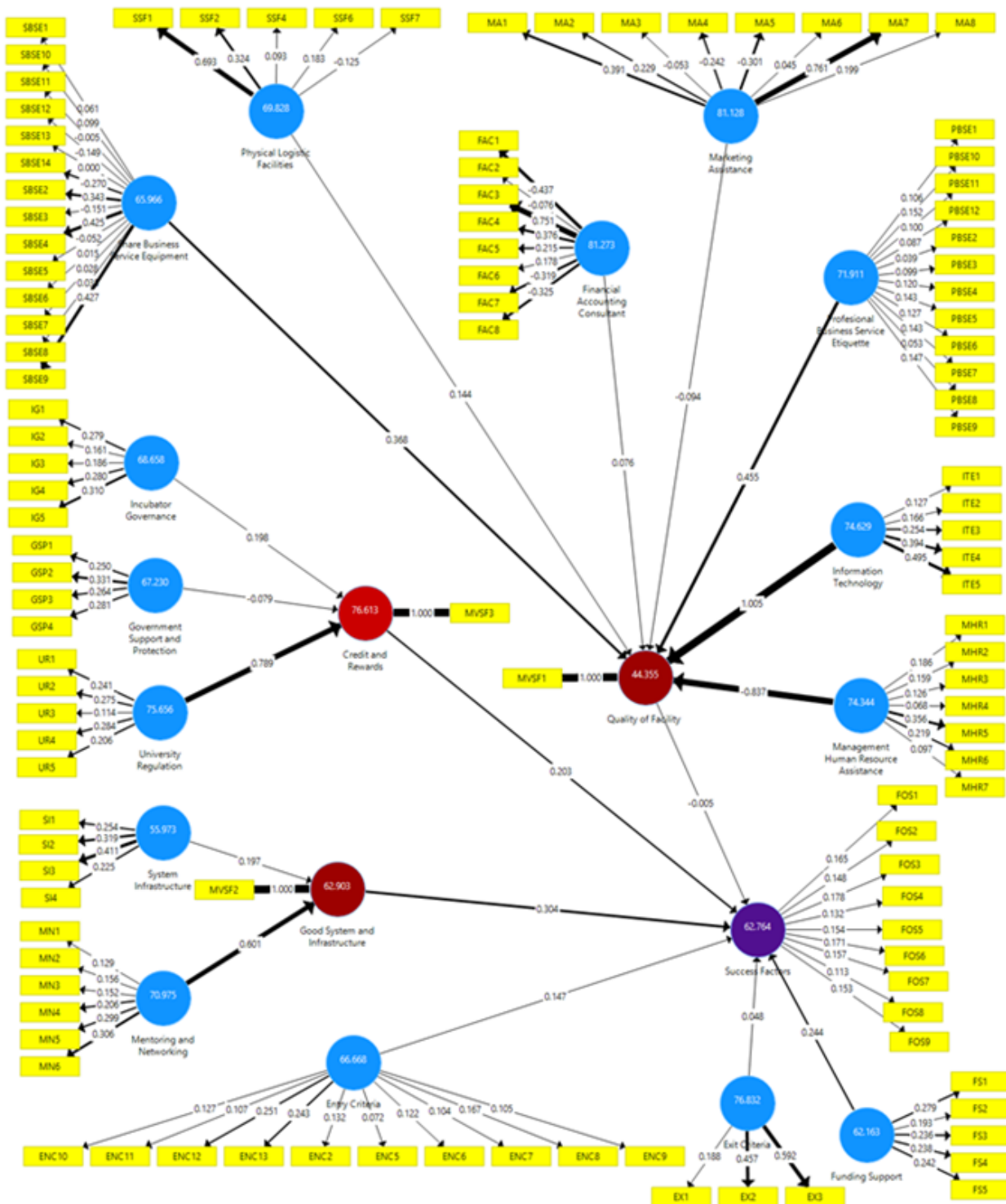


Figure 2 Importance performance map analysis of the factors of successful business incubators among Indonesian public universities

4.4. Structural Path Coefficient

After the model was entered into the SEM software package and the analysis was conducted, the result of the fitness measures indicated whether the research hypotheses were accurate or not. The ratio of each parameter to its standard error corresponded to a z test for the significance of the relationship with $p = 0.05$ and a standard deviation of 1.96 (Jackson et al., 2005).

The strong effect of critical success factors and moderating factors in business incubators for Indonesian public universities are: (a) credit and rewards to age and the quality of the facilities; (b) information technology to age and the quality of the facilities; (c) mentoring-networking to good system and infrastructure; (d) success factors to entry criteria, exit criteria, and the funding support; and (e) the universities' regulations to credits and rewards factors (refer to Table 2).

Table 2 Structural path coefficient model for this research

No.	Critical Success Factors	T statistics	P values
1	Age and quality of facilities → Success factors	0.836	0.404
2	Credit and rewards → Age and quality of facilities	1.513	0.131
3	Financial accounting consultation → Age and quality of facilities	0.282	0.778
4	Good system and infrastructure → Success factors	4.996	0.000
5	Government support and protection → Credit and rewards	0.226	0.821
6	Incubator governance → Credit and rewards	0.435	0.664
7	Information technology → Age and quality of facilities	2.786	0.006
8	Management human resource & assistance → Age and quality facilities	1.241	0.215
9	Marketing assistance → Age and quality of facilities	0.136	0.892
10	Mentoring and networking → Good system and infrastructure	2.738	0.006
11	Physical logistic facilities → Age and quality of facilities	0.656	0.512
12	Prof Business Service and Etiquette → Age and quality of facilities	0.267	0.789
13	Shared business service and equipment → Age and quality of facilities	1.289	0.198
14	Success factors → Entry criteria	11.433	0.000
15	Success factors → Exit criteria	6.152	0.000
16	Success factors → Funding support	10.521	0.000
17	System infrastructure → Good system and infrastructure	0.819	0.413
18	University regulation → Credits and rewards	2.354	0.019

5. CONCLUSION

The results of this study demonstrated that the effect of critical success factors, namely entry criteria (Berge et al., 1989), exit criteria (Berge et al., 1989), funding support (O'Neal, 2005), mentoring-networking (Agnete Alsos et al., 2011; Miller et al., 2011) and university regulations (Mian, 1997), directly affect the business incubators for Indonesian public universities. Furthermore, the results showed that the moderating factors, namely credit and rewards (O'Neal, 2005), good system and infrastructure (O'Neal, 2005) and the age and quality of the facilities (Verman, 2004), significantly affect university regulations, mentoring-networking and information technology, respectively.

A good system and infrastructure showed a strong relationship with the success factors, and information technology showed a strong relationship with the moderating factors, especially age and the quality of the facilities. Mentoring and networking had a strong connection to the moderating factors, namely good system and infrastructure, and university regulations had a strong relationship with the moderating factor of credit and rewards. It cannot be denied that entry criteria, exit criteria and funding support are associated with the success factors. This finding could improve the management of business incubators in Indonesian public universities and make them more successful. These research findings may persuade Indonesian public university business incubators to give more attention to the development and management of the business incubators on their own.

This study has ascertained the effect of critical success factors and moderating factors for the business incubators in Indonesian public universities. Voisey et al. (2006) utilized business incubator measurement to manage business incubators performance, economic policymakers and stakeholders of the importance of learning strategies. Universities' business incubator

regulations and environments enable and encourage the start-ups to exchange ideas and achieve success in business creation. The entry criteria are important not only to select start-ups to implement their business ideas, but also to support business learning communities in entrepreneurship learning programs.

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