

IT GOVERNANCE OF THE BUSINESS INCUBATOR SERVICE: STARTUP READINESS LEVEL

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ABSTRACT. *Information technology has been widely perceived as one of the supreme catalysts to innovation. This owes to the fact that quantum computing known as Internet of Things (IOT) has penetrated all aspects of human life. Countless innovations are sprung from how society reacted towards daily problems. This paper aims to shed light on study to create a systematic smart society environment for Business Incubator Service to enhance commercialization and sustainability of the small medium enterprise as proposed by the software industry from business incubator tenants and the rise of its commercialization process within higher education.*

Keywords: IT governance, Business incubator, Technology transfer, Startup readiness level

1. **Introduction.** Higher education, like any other aspects of human life, is not immune to the penetration of information technology, in particular quantum computing known as Internet of Things (IOT). The microcomputer devices known as smart phones are currently the most widely used tool for mobile learning nowadays. Without innovation, today's technology can become obsolete tomorrow [1].

One of the media of learning that gains importance is co-working space. The growing popularity of co-working space as an innovative medium of learning in the higher education has led to the birth of Business Incubator Service. It serves a media for millennial generation to utilize applied research technology, to increase technical skills and to serve customers' needs during the business process in society.

Business incubator encourages the development of national economy [2]. Hence, the development of business incubator ecosystem should be organized and supported by government and other relevant stakeholders such as chambers of commerce, external consultants, university as well as venture capital teams. It should also be supported by performance analysis indicators that are integrated systematically within business management model. Incubator model evolves significantly to achieve Incubator Service operator goals and objectives through coordination and collaboration from multiple disciplines [3] as well as integrated community based on performance indicator outcome [4]. The systematic and integrated operation service as part of daily routine services to serve tenant incubator(s) during the project running is designed to achieve business sustainability.

Over the past decade the implementation of good governance has significantly altered the development of business startup environment in higher education services. Accelerating the growth of business startup demands better corporate governance. The performance of Startup Company has shown a positive trend, and in some cases is aggressively rising, in most if not all areas of industry. It requires a better management focus and also disruptive innovation [5]. To date, there are some worth noting examples of disruptive innovation launched by startup founders in all aspects of mobile applications to meet innovation product to the market [6].

By applying the concepts of Entrepreneurship Academic Purposes Model (EAPM) with Startup Readiness Level (SRL), this paper aims to shed light on the sustainability of startup business from tenant graduates after they pass incubator services at higher education. This study also measures the startup to continue their business after 1 year launched. In particular, this paper focuses on the implementation of EAPM and SRL into good corporate governance in business incubator program with IT as a tool to measure the following:

- To assess a multipurpose learning outcome model activity in technology based higher education;
- To create Business Readiness Level in Business Incubator Service and Indicator as well as key factor specifically component to be included during the tenant development process in the incubator program;
- To increase service impact and improve tenants' success after following the schema process from the first year of study at Entrepreneur University.

There are several problems identified from tenant graduate at Business Incubator Service in higher education. The following Table 1 shows intake tenant occupancy services from 2015 to 2018 from private university that runs business incubator center in Indonesia.

TABLE 1. Tenant intake result from university incubator service

Campus Area	Intake	#Startup	Tenant Graduate (Continue)	Successful rate in total by percentage
Area 1	2015.1	19	0	43.1%
	2015.2	12	3	
	2016.1	87	17	
Area 2	2016.2	23		
Combine Area	2017.1	115	34	
	Area 1	2017.2	71	
Area 2	2018.1	40	5	
	2018.2	120	37	

The table shows that after 1 year graduated, the sustainability of business is limited. The proposed model increases the sustainability of graduate from low level to high impact business within the proper industry. This paper highlights a comparative study between Business Incubator Service in industry and Business Incubator Service in higher education institution in Jakarta, Indonesia. The remainder of this paper is constructed as follows: theoretical background that introduces concepts namely business incubator and indicators, IT governance and mechanism and smart city environment, followed by explanation on research methodology, analysis on the findings of the study and conclusion.

2. Theoretical Background.

2.1. Definition of business incubator. Business incubators allow startups to access a variety of resources and services intended to accelerate their unique prototype. The

business incubator center enables to assist new venture creations [7] to be more successful when they receive technical business assistance from the networks as they are able to enhance their business performance and nurture to essential e-services [7]. The objectives of business incubator program, inter alia, are to reduce unemployment rate in the countries through job creation, to connect tenant applicant to network society and to get financial access.

Business Incubator Service is considered a progressive program to achieve tenant objectives and goals to deliver high impact of service as new startups company [8,9]. In an early stage, the tenants of the incubator receive a myriad of services such as a spacious co-working space, mentoring, networking, coaching as well as demo day to proper venture capital [10]. Figure 1 shows a relationship between tenant and company as an investor.

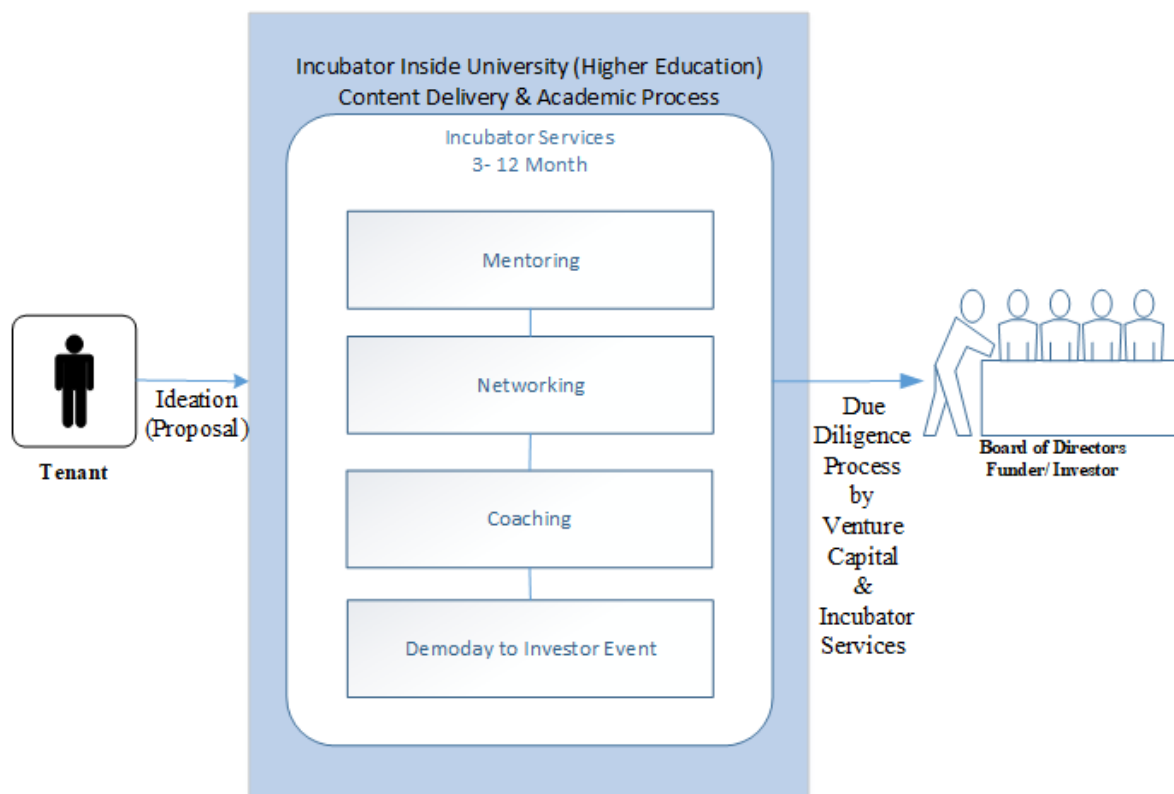


FIGURE 1. Relation scheme of the university incubator service

2.2. Business incubator performance. The need to improve business incubator performance on the one hand and to achieve tenant satisfaction index on the other hand, complicates the business incubator management task operationally. How to gain those two goals of business incubator performance requires tenant graduate participation. Contributing factors of tenant graduate performance in a successful small business' venture are diverse in nature [11]. Gauge tenant survival not only to rely on process but also on the personal factor since there is no single agreed definition of success.

2.3. Information technology governance definition. Information technology governance refers to professional organizational capacity conducted by the board members, governing body and also Information Technology Management (ITM) to direct the procedure and implementation of IT strategy to deliver the visual perception of business and IT strategy [9].

IT startup runs a small enterprise that involves good governance service mechanism, business pattern, business model and IT reporting system.

2.4. Information technology government mechanism. Tenant Startup Incubator should follow a scheme of IT governance implementation that lies in a set of practices namely structures, processes and forms of relationships mechanisms of integration [12]. The organization corresponding to tenant's company unit carries out responsibility of decision making, creation of committee and strategic position inside the company. The structure mechanisms shown in Figure 2.

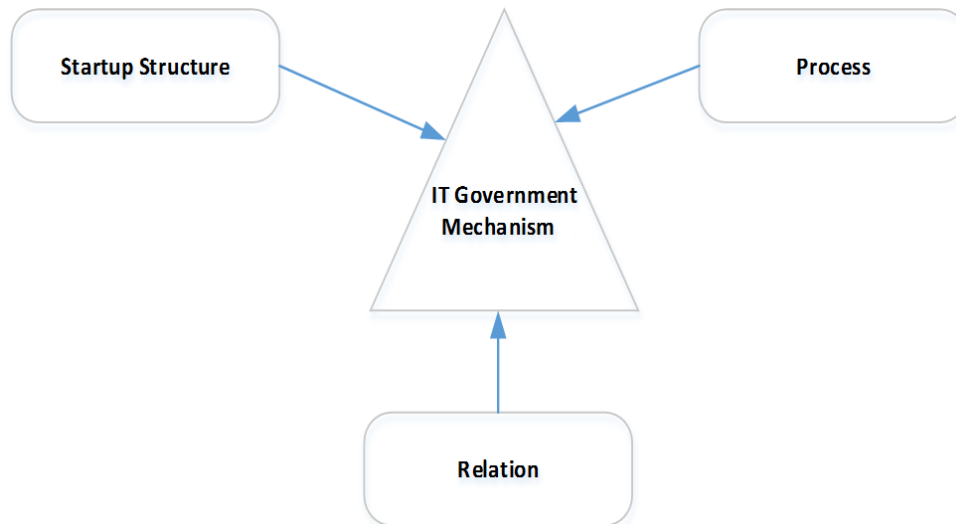


FIGURE 2. Startup interaction ITGM model

IT governance performance and implementation can be different from one country to another. The ability of company's team to meet objective goals set by the board members to formulate and implement good governance mechanism of IT strategy as well as to verify the management of business and IT alignment [13] is varied.

2.5. Definition of smart society environment. The contextual definition of smart society environment consists of some elements such as terminology, boundaries, scope and also component which is summed up as follows [14]:

- Smart society made by lands, citizens, technology and governance [15],
- Smart society could have a bigger boundary from urban dimension of single city into a region or network of the city towards national and of global dimension,
- It is well-defined, well-managed, with measurable goals, environment sustainability, the creation of smart intellectual capital and, citizen participating,
- It is called smart because it is intelligent, inclusive, sustainable, digitally wired and democratic.

As a comprehensive definition of smart city implementation needs a huge geographical zone with high implementation of technology usefulness such as ICT, energy production, logistic controlled, it creates benefit for citizens in terms of their wellbeing and inclusive participation as it is a well-defined society. Hence, the development of rules and policies as well as system for the city government needs proper attention from the people within the society [16]. In short, by the definition, smart city is merely not about the benefit of IT, but the connectivity between stakeholders by using IT as a tool to connect and to enhance human life.

3. Methodology. This research employs an extensive literature review and utilizes above-mentioned conceptual framework [11]. It investigates the dissimilarities between incubator service in higher education and regular Business Incubator Services in industry. In general, incubator services technology based on industry follows the scheme and direction of regional development. There are several concepts as follows.

3.1. Cluster concept. The multifariousness of constellate lookout on regional economic development, such as a triple helix culture concept which supports the economic and social growth in developing economic growth such as in Brazil [11] is one of the well-documented examples of how the concept is effectively implemented. Another example of cluster concept for instance, is implemented in several private universities in Jakarta, Indonesia.

3.2. Regional concept. The regional system concept refers to business process, disruptive innovation, activities of creating, developing and commercialization of innovation as well as system. The whole system in society includes business organization that involves in the innovation process. All innovation processes are jointly-operated in a highly efficiency manner.

3.3. Technology concept. The technology concept is often described as a type of cluster city that implements technology in the society. For instance, all dimensions of business type with multiple customers and suppliers, such as government as a regulator and research institution or research technology transfer office within university. The type identifies regulatory agency and educational assistance to the business.

3.4. Incubator and regional development concept. Incubator regional development concept refers to assist implementation of all innovation processes from tenant's activities of creating, developing and commercialization as whole of system. The system comprises business organization directly involved to support the establishment of the company [17]. Once the tenant graduate is graduated from the incubation process, the company in return shall open new business and also new opportunity in the society. Moreover, further process should continue and be connected to the society as it becomes a networking partner or else whereas continuing improvement services directed by the management.

3.5. Assessment concept of methodology. Higher education is a part of ecosystem which creates future generation to continuing business legacy [18]. Business incubator process lifecycle in higher education needs to be systemized due to high demand of new innovation program; proposed better performance indicator level after 3 years operational; and also needs to be evaluated for opening room of improvement. This concept is described as shown in Figure 3.

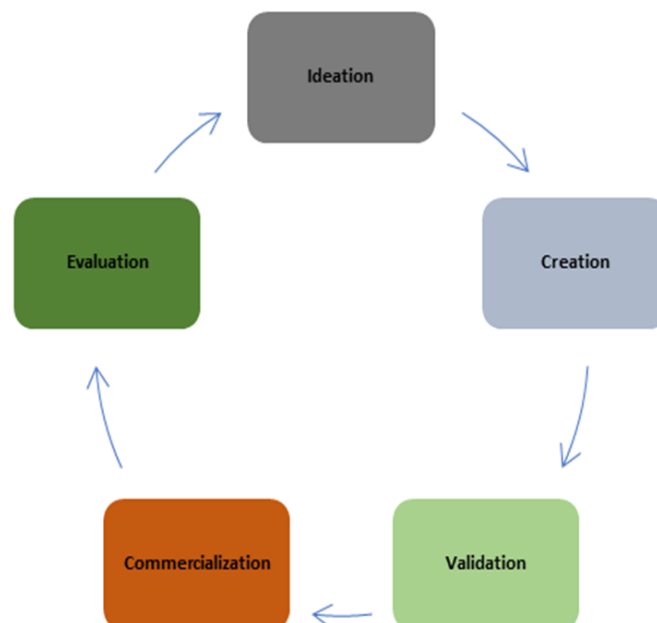


FIGURE 3. Business incubator program lifecycle

On the other hand, Business Incubator Service in higher education should follow academic process delivery. In order to meet government’s objective and university’s goal to deliver quality graduates [19], higher education should elaborate the content of learning process under the scheme of Entrepreneurship Academic Purposes Model (EAPM). The EAPM of incubation process in higher education consists of three critical main concepts as follows:

- The development state of the company using technology as business architecture,
- The company maturity of which Startup Company is able to conduct the business immediately,
- To meet sustainable business as a part of people development to support government’s goals.

The objective goal is to increase scalability for the tenant graduate within short time period of evaluation. In higher education, the program derives two steps of enrolment for 35 majors and faculties conducting operational model as seen as diagram in Figure 4.

Seeding Stages Creativity Enlighten		Cultivation Stages Innovation Practice		Starting Up Stages Entrepreneur Implementation	
↓		↓		↓	
Inspiration	Practice	Implementation	Coaching & Final Project	Funding	
	Internal Exhibition, Training	Market Test, External contest, Competition	Method: Advisory; Mentoring	Get funding, External Resources	
Curriculum	Curriculum	Curriculum	Enrichment Program	Enrichment Program	
↓	↓	↓	↓	↓	
Entrepreneurship Course (EN1) BMC, Financial Plan	Entrepreneurship Course2 (EN2)	Entrepreneurship Course 3 (EN3)	Challenge, feedback, mentor Session, Demoday, PitchSession	Challenge & Feedback for Sustainable Business	
Challenge & Feedback from Entrepreneur Expertise (Lecturer)	Challenge, feedback, and mentor Program by expertise /other lecturers/ alumni	Challenge, feedback, & mentoring by expert/other lecturers/ alumni	Final Project Venture Capital	Business matching to investor Coaching by expert/alumni Technology licencing	
↓	↓	↓	↓	↓	
Score / Credit	Score / Credit	Score / Credit	Score/ Credit	Score / Credit	
Idea Creation	Prototyping	Validated Prototype	Product Ready & Thesis	Get Funded, Technology License (IP)Francise, Brand	

FIGURE 4. The higher education model proposed for incubation process for sustainable outcome

Thus, business incubator startup readiness level is the part of model proposed to meet business incubator model in higher education.

The business readiness level consists of nine level steps of goal to be implemented from business incubator system in higher education. The level of readiness concept is the following:

- Conceptual articulation
- Technology and application described
- Laboratory studies and analysis
- Limited capability prototype validation in laboratory
- Full capability prototype validation in laboratory
- Prototype validation in relevant environment
- Actual system validation in a relevant environment
- Initial production and rollout

- Full production mode

Startup Readiness Level definition in higher education service managed by business incubator centre is shown in Table 2.

Combining Entrepreneurship Academic Purposes Model (EAPM) with Startup Readiness Level (SRL) and applying them in the university, the entrepreneur’s startup from university becomes systematically crafted. In doing so, the university can marshal entrepreneurship with science and education.

TABLE 2. Startup Readiness Level

Definition	Level	Startup Readiness Level
Lowest level of readiness where the intention surfaces to translate an idea into a business venture.	1	Inventor (or team) with a dream/idea
Once the basic ideas have been formulated, they are elaborated on paper in studies and analyses on the business opportunity.	2	Paper studies and business analysis produced (analyzed idea)
Active research and development are initiated, including analytical/laboratory studies to validate predictions regarding the market, the competition and the technology.	3	Capability for conducting business experimentation (validated idea)
Basic technological and business components are developed to encourage tenant to work together; an initial business plan is available.	4	Capability to work limited-scope R&D programs with project teams (prototype)
The basic technological and business components are integrated with reasonably realistic supporting elements. The business plan is sound and credible, but still needs to be validated against the final product characteristics.	5	Capability to support project engineering development and design/customer & partner validation (validated prototype)
A representative prototype system is tested in a relevant environment. The business team is still incomplete and the venture not yet ready for commercialization. A full business plan including market, operational, technological and financial aspects is available.	6	Capability to support development and design with a market-driven business team (product, no revenue)
The business can run on a limited scale. The full team is in place.	7	Capability to support limited production/full business team (product, limited revenue)
The technology has been proven to work and the venture structure has proven to be able to support growing market shares.	8	Capability to transition to full production and distribution (product & revenue)
The offering incorporating the new technology has been used in operational conditions and the business is running with a growing market share.	9	Fully articulated business with appropriate infrastructure/staffing (growing market share)

4. Result and Discussion. The main objective of this paper is to conduct a proposed model of IT governance of Business Incubator Services in smart society environment by combining Entrepreneurship Academic Purposes Model (EAPM) with Startup Readiness Level (SRL) and applying them into university. By so doing, the study endeavors to attain solid ground for university to create entrepreneurs.

In the process, during 2015 to 2018 from the total of tenant successful rate, student to become entrepreneurs is 43.1% from 487 tenants and it accounts for around 209 tenants. These tenant successful rate which is below 50% trigger the student settlement as entrepreneurs for their major career. Most of the students have sufficient knowledge and good prototype products, but lack the ability to sell the products. It proves to be a challenging issue for university to address.

Analyzing the practice of entrepreneurship in the university for the said period, those two issues have become a stumbling block to increase more amounts of startups. Nevertheless, the students' idea and passion solely are not enough to fuel the entrepreneur's spirit to run the startup. The students have difficulty facing reality that running business is a risk taker and they must risk their financial status into their startup.

In all, all candidates were proposed to use model learning as a tool for business readiness, and the level matrix compliances to business incubator was used to measure the student in creating Startup Company. Therefore, before the students enter incubator program, key entrepreneurship values must be taught such as creative thinking and entrepreneurship concepts. Thus, students are equipped with sufficient knowledge, and hence, set goals to achieve during the program, which is creating Startup Company.

5. Conclusions. The interaction between business incubator program and tenants is often referred to as process development business startup inside business incubator. The Higher Education Management should have a systematic model [20] to achieve objectives and targets that correspond to government's policy to increase entrepreneurs who will become key pillar of national economy. However, this is a long road to journey. In practice, many issues need to be addressed, including fundamental issues such as entrepreneurs as a chosen career. One of the determining factors that contributed to successful rate of the students creating startup below 50% is because students refused to choose entrepreneurs as their career choice. In this regard, new approaches need to be formulated within teaching learning process.

To change the mindset of students to become entrepreneurs by creating their own Startup Company needs strong ecosystem to build that enable them to do so. Deep interaction amongst business practitioner, academician, and government within learning process in the university, could create new culture and new mindset for students. With a strong business ecosystem and blending it into higher education curriculum, the successful startup will be increased.

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