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Design of University-based Venture Gestation Program (UVGP) for student venture

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ABSTRACT

Design science methodology was used to develop and test a University-based Venture Gestation Program (UVGP), the model built after identifying key problems and reactions to them in student-based gestation ventures. The model relied on a three-year longitudinal comparative case study of a successful and an unsuccessful student venture team. The teams came from the same university and were winners of business plan contest in 2012 and 2013. Although the teams were very similar to begin with, analyses revealed that different responses to three shared problems were key determinants of venture gestation success, and failure. Based on these observations, three design principles, termed tenure, competence compatibility and entrepreneurial bricolage, were adapted to derive a solution model, the Venture Gestation Model (VGM), with the aim of improving chances of gestation success. To develop the model, the study drew on dynamic capability theory, and subsequently yielded the UVGP which provided concrete tools (prescriptions) toward venture gestation success. As a means of testing the designed solution, an evaluation of the program was conducted by observing the gestation venture of the 2014 winner of the annual contest. Findings showed that gestation success depended more on the effectiveness of the program in increasing awareness of internal problems than on reactions to external changes. However, the prescription on competency compatibility required enhancement to address and overcome competency development issues.

Keywords: Venture gestation, design science methodology, dynamic capability, University-based Venture Gestation Program (UVGP), student-based venture

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CHAPTER 1: INTRODUCTION

Increasing attention is being devoted to the research of venture gestation in the field of entrepreneurship (Gartner, 1990; Oviatt and McDougall, 1994; Liao et al., 2005; Hindle and Klyver, 2011). The concept of gestation originates from the introduction of the term “nascent venture”, which first appeared in an article by Reynolds and Miller in 1992. In nascent ventures, members take steps towards venture formation (Carter, Gartner, and Reynold, 1996). Other terms with the same connotation include firm gestation (Reynolds & Miller, 1992), organizational emergence (Gartner, Bird, & Starr, 1992), pre-organization (Katz & Gartner, 1988), and start-up (Vesper, 1990). However, Reynolds and colleagues (1992) specifically highlighted the term “gestation” as a process of conception till birth of firm. This paper defines gestation venture as the venture that undergoes all the stages of gestation. Even though the venture gestation process is complex with uncertainty in its business concepts, there are few existing literatures that provide empirical models for venture gestation, with the exceptions of Bhave (1994), Reynolds and Miller (1992), Carter and colleagues (1996), Liao and colleagues (2005). However, none of them has provided empirical evidences based on solution testing for ventures that are initiated by university students. Thus, within the observable context and existing experimental conditions, this study will show how to make the venture gestation process successful by student-based venture through the design and intervention of a University-based Venture Gestation Program (UVGP). In this study, success is defined as the ability to react to changes in such a way as to complete gestation goals within specific time limits.

1.1 Research of venture gestation

Much of the existing researches that explore the venture creation process have explained venture gestation to be a linear and unitary in nature. Hindle (2011) highlighted two perspectives of venture occurrence. Firstly, under the creation or opportunity perspective, he described venture as one being created through discovery, exploitation of opportunities (Shane and Venkataraman, 2000). On the other hand, under the emergence view, new venture is viewed as synonymous in structure, process and procedure (Katz and Gartner, 1988). The linear model implies that an additive combination of events will lead to the creation of a new firm (e.g., Carter et al., 1996; Reynolds & Miller, 1992). Yet, there is little empirical evidence that either validates or fails to validate the linear model.

In this study, venture gestation is viewed using the evolutionary perspective, which considers the entrepreneur, the team, and the external environment. Within the gestation trajectory, gestation path is observed not just as a linear path (Carter et al., 1996; Reynolds & Miller, 1992; Bhave, 1994), but also a non-linear progression.

There are limited empirical studies that focuses on venture gestation process (Reynolds and Miller, 1992; Bhave, 1994) and gestation researchers (Hindle and Klyver, 2011). Hindles and colleagues (2011) classified gestation studies into three groups of perspectives. The first group is the study on entrepreneurial intention (Kruefer, 1993). Next, the second group is the study on gestation model (Katz and Gartner, 1988; Reynold and Miller, 1992; Newbert, 2005). Finally, the third group is the study on antecedents of gestation stages and process (Bhave, 1994). In addition, the development of new venture has been studied extensively at the level of a market but less adequate at the level of the firm, or the entrepreneur (Carter et al., 1996; Katz and Gartner, 1988).

Hindles and colleagues (2011) classify gestation studies along three types of perspectives. The first is the study of entrepreneurial intention (Kruefer, 1993). The second is the study of the gestation model (Katz and Gartner, 1988; Reynold and Miller, 1992; Newbert, 2005). Finally, the third type is the study of antecedents of the stages and process of gestation (Bhave, 1994). In addition, the development of new ventures has been examined extensively at the level of market, but less adequately at the level of organization, or that of the entrepreneur (Carter et al., 1996; Katz and Gartner, 1988).

1.2 Gestation of student-based venture

Research on university-based venture gained attention since development of “Silicon Valley and “Route 128” (Cooper, 1971; Roberts, 1991). However, among the studies on different types of ventures, research that focuses on student-based venture is considered as most cursory and lacks in empirical evidence (Albert et al., 1991; Bellini et al., 1999; Laukanen, 2000; Pirnay et al., 2003).

Two school of thoughts are formed to explore the definition of student-based venture. The first group views student-based ventures as the ventures formed by students, who are the entrepreneurs and also the scientists that exploited his or her own research result or university knowledge (McQueen and Wallmark, 1982; Bellini et al., 1999, Steffensen et al., 2000).

On the other hand, the second group, make up of Pirnay and colleagues (2003) differentiated ventures that are initiated by academic and students. They refer academic-based venture as ventures which are basically created to exploit, in business, some promising results obtain by university researchers, whereas student-based ventures as the ones which are usually

launched to exploit business opportunity that is rarely grounded on extensive research activities. Furthermore, student-based venture tends to be concentrated in sectors with little entry barriers, such as internet application sector. The clear definition is crucial as the typology of university-based venture, which include academic-based ventures or student-based ventures, varies according to large extent in terms of activities, financial needs, material requirements and growth perspectives, which have implications on venture gestation.

In particular, many scholars specify the conditions of the university members, whether academics or students, to be the entrepreneur as well as the scientist that exploited his or her own research result or university knowledge (McQueen and Wallmark, 1982; Bellini et al., 1999, Steffensen et al., 2000) to be essential in the definition, while others only emphasize on the role of exploiting what has been created (Pirnay et al., 2003). However, none of them has conducted any empirical study on the gestation process initiated by students.

The lacking of attention on student-based venture amongst universities are due to several reasons. Firstly, there is a low number of successful “churn out” cases amongst the universities, despite of the increasing development of entrepreneurship system in the university environment. Secondly, there is a lack institutional performance indicators to account for the creation of student-based venture. Most universities position themselves as only educating entrepreneurial mindset and business skills, but not accountable for venture gestation outcome. It is also tedious to monitor and follow up with the venture gestation, especially when student entrepreneur graduates and leaves the parent university. Thirdly, most students are not aware of their “venture gestation” commencement and lacks recognition of their “gestation” entrepreneurs` identity even though they may have possessed the intention and undertaken some form actions related to venture gestation that path the

venture emergence. Thus, it gives rise to the importance and value of this research to focus on student-based venture as the type of venture to be used as case study, and to address that gap in understanding the cause of the success or failure of venture gestation in entrepreneurship studies.

There is an increase in the quantity of entrepreneurship education and business plan contest amongst universities that encourage entrepreneurial students to brainstorm on ideas and creation of attractive business plans. However, little effort has been done to understand why and how student continue or not continue the gestation. On the other hand, existing university-based incubation mainly focus their services on venture activities targeted at "ready" venture who are at their early stage, with conditions of a market ready prototype, initial capital outlay and a committed and competent founding team. Little was known about what happened throughout the course of gestation that led them from conception to the ready for incubation stage.

Adapting the existing definition of university venture, also termed as university spinoff (Smilor et al., 1990), this study defines student-based ventures as any type of formal organization with the following characteristics: (i) purposed toward profit or non-profit, but not yet legalized, (ii) established by one or more students at the university, (iii) utilizing their research outcome in creating a business plan and transferring relevant skills acquired through their studies, and (iv) undergone gestation from business plan creation to prototype validation with prospective opportunity by end users within 12 months.

In this study, the gestation period of student-base gestation venture is defined as the difference in timing since first and last event for gestation. According to Reynold (1992), the medium of two gestation events are about 6 months for a typical complex organization. The

more the gestation events, if run sequentially, the longer will be the gestation period. This study proposes a 12-month gestation period from business plan till prototype validation by end user for a low to mid-level technological oriented research-based gestation venture as the case study for the solution intervention and evaluation.

1.3. Criteria of venture gestation success

There are multiple criteria that are described as the success of venture gestation. Reynold and Miller (1992) highlighted the following criteria: personal commitment from gestation team members through direct investment, financial support from external source, first sales with income, and hiring of either full time or part timer staff. On the other hand, many argued that commercialization of product or services signified the end of gestation, and thus lead to a maturity time for new organization (Behave, 1994; Block and MacMillian, 1985, Liao et. al, 2005). Katz and Garner (1988) focused on five economic factors, such as market entry, Intention to achieve organ purpose; create boundary/Incorporate; assessable resources (financial), exchanges (trade resources across boundary). Birley (1984) combined eight economic and cognitive factors to explain essentials process of a successful gestation. Decision to start firm with commitment; owner quits job and becomes self-employed; incorporation; bank account established; premise and equipment acquired; first order received or first sale; paid first tax; and first full time staff hired. Reynold (1992) combined accessible resources (financial), macro and micro factors, decision to start firm commitment; owner quits job and becomes self-employed and first full time staff hired.

There are no agreement on the definition due to the difference in the product range and industry, for the explanation that gestation success is complex with more than one single

characteristics exhibited by a venture. This study measures success of gestation by both tangible and intangible outcomes (refer to Table 1). Tangible outcome includes (i) a completed prototype within validation from end user as an acceptable outcome for consumption; (ii) with one or more original members from founding team students at the end of required gestation; and (iii) minimum funding amount raise for the required prototype. Intangible outcomes includes (i) possessed competency to replicate same or similar prototype or product by existing members; and (ii) relevant track records of gestation, example formal recognition or endorsement by reputable party on gestation outcome.

Table1: Indicators of gestation success

Types of outcome	Indicators
• Tangible outcome includes	(i) With a completed prototype within validation from end user as an acceptable outcome for consumption. (ii) With one or more original members from founding team students at the end of required gestation. (iii) With a minimum funding amount to be raised for the required prototype.
• Intangible outcomes includes	(iv) With competency to replicate same or similar product/prototype by remaining members (v) With relevant track records of gestation Eg: formal recognition or endorsement by reputable party on gestation outcome

1.4 Entrepreneurship education and related facilities in School on Internet (SOI) university network

School on Internet (SOI) university network is an Asian-based university network formed by 28 cutting edge universities across Asia, established since year 1990. One of its aim is to enable the sharing of education curriculum, fostering of joint research and promotion of entrepreneurship amongst academic and students, by using the standardized and shared common communication satellite-based infrastructure.

In terms of promotion of entrepreneurship, there are different emphases undertaken by the different universities (refer to Table 2). Of which, University of Brawijaya (UB) focuses on providing compulsory entrepreneurship education to cultivate entrepreneurial mindset to all students, regardless of their discipline. On the other hand, in Keio University (KEIO) and Chulalongkorn University (CHULA) have specific curriculum that imparts knowledge ad competency to develop business plan for specific faculties as elective academic curriculum. University of Sains Malaysia (USM) and University of Computer studies, Yangon (UCSY) focus on the creation of IT business, mainly for information and technology disciplines. Furthermore, most of the universities have some form of entrepreneurship related facility, such as incubation center. However, the center are mostly catered for academics, with restriction that “hinder” participation by students.

In general, business plan creation is a common outcome directly or indirectly through the entrepreneurship education and non-academic curriculum activity. Incubation support services are only limited within KEIO, CHULA, UB and ITB. However, from venture gestation perspective, there is a gap in knowledge and competency by the student gestation venture from the stage of business plan creation till the stage of venture establishment. It can be

evident from the hundreds of business plan churned out by university, while very few actually "spin off" successfully from gestation stage by students from these cutting edge universities in Asia.

Table 2: Focus of entrepreneurship education amongst SOI Asia University network

S/N	Country	University	Focus on entrepreneurship Education	Availability of entrepreneurship facilities (eg: Incubation centre)
1	Japan	Keio University (KEIO)	Business plan creation Knowledge on new business in emerging market	Available, only use by few students
2	Thailand	Chulalongkorn University (CHULA)	Business plan creation Knowledge on new business in emerging market	Available for usage by academic , but not for students
3	Malaysia	University of Sains Malaysia (USM)	Business plan creation Creation of IT business	Available for usage by academic , but not for students
4	Indonesia	Institute of Technology Bandung (ITB)	New business creation Business Plan Creation	Available, only used by few students
5	Indonesia	University of Brawijaya (UB)	Entrepreneurial Mindset Business Plan Creation	Available, only used by few students
6	Myanmar	University of Computer studies, Yangon (UCSY)	Creation of IT business	Not available

1.5 Research question and objectives

Based on the research gap identified from the prior literature review and the gap in existing entrepreneurship education among universities in SOI Asia university network, this study will address the research question on how to create gestation success for student-based gestation venture in university. Much of the past researches have been descriptive, or even if empirical, mainly relied on existing data sources, without any attempt to provide evidence on solution testing for venture gestation success. The objective of this study is to determine what is needed to design a program within the university that would result in gestation success for ventures initiated by university students.

1.6 Structure of study

In order to answer the research question, the study applies design science method in four systematic stages, as per the outline of the study. Firstly, the initial design inputs are derived from problem identification using a longitudinal comparative study of two student-based gestation ventures, with one successfully incorporated as venture and the other ceasing gestation midway. The two cases are selected among a cohort of observable student venture teams within the participating universities. Secondly, the study conducts literature review and cross case analysis to understand the problem and produce the principles needed for constructing a gestation model, as the additional design inputs. Thirdly, using the design inputs of two case studies and the literature review, and the context of the existing entrepreneurship activities among the participating universities, the author set out to conduct interviews with the relevant gestation informants in order to develop an educational program for venture gestation as the design solution. Finally, the program is deployed and evaluated

using a single student-based gestation venture, selected from another cohort of student venture teams, to measure the effects and validity of the designed solution.

This paper is structured with chapter 1 and 2 as the introduction and application of design science method for the research. Chapter 3 ,4 and 5 entail the construction of venture gestation model through the two sources of design inputs, which include the problems identification and literature reviews related to the resolving the problem. Next, chapter 6 and 7 explain the creation and evaluation of the designed solution as means of forestalling gestation problem. Finally, chapter 8 concludes with implications, limitation and future research, and research contribution.

CHAPTER 2: RESEARCH METHODOLOGY

2.1 Design science methodology

This study applied design science in entrepreneurship to develop a solution for venture gestation. The approach has been commonly used in engineering, medical science, and management research (e.g., Dunbar et al., 2007; Romme, 2003; Van Aken, 2004). Within the management research field, Van Aken (2004) defined design science as a method for the development of tested and grounded technological rules to be used as design exemplars of managerial problem solving.

2.1.1 Prescription driven design science

Van Aken (2004) differentiated the uniqueness of prescription driven science from the description driven science (refer to Table 3). Explanatory science defines role of science to provide explanation for the phenomenon of the world. Research methodology is theoretical driven and focus on existing situation (Aken, 2007). It merely focuses on the development of conceptual framework. Theory is constructed through forming causal relationship of variables. The outcome is formation of explanatory theories to offer explanation and prediction. On the other hand, prescriptive science seeks practical answers to immediate questions by getting usable information (Sommer and Sommer, 1980). It aims to provide solution to improve reality and describe what should be done.

Table 3: The main differences between description-driven and prescription-driven research program (Aken, 2001)

Characteristic	Description-driven research program	Prescription-driven research program
Dominant paradigm	explanatory sciences	design sciences
Focus	problem focused	focused solution
Typical research question	explanation	alternative solutions for a class of problems
Typical research product	causal model; quantitative law	tested and grounded technological rule
Nature of research product	algorithm	heuristic
Justification	proof	saturated evidence

2.1.2 Applying design Science in entrepreneurship

So far, only a few studies have applied design science method to understand about entrepreneurship, such as Van Burg and colleagues (2007) and Sarasvathy, (2003 and 2004).

Burg (2007) utilized the emergent design science approach to study the process of forming of university startup from organization perspective. In the research, he linked the application of scientific knowledge produced by entrepreneurship scholar with practitioners. On the other hand, Sarasvathy (2003) utilized the design science method to study the factors that led to success on internationalization of new ventures.

The field of entrepreneurship and the context of student based venture development is at their cross juncture which lacks acceptable methodology or theoretical framework. Thus, it undergoes the emergent design processes as mentioned above. Design science is well suited to apply in this study as it is solution oriented rather than merely problem solving and descriptively driven. This is appropriate as previous gestation researches are

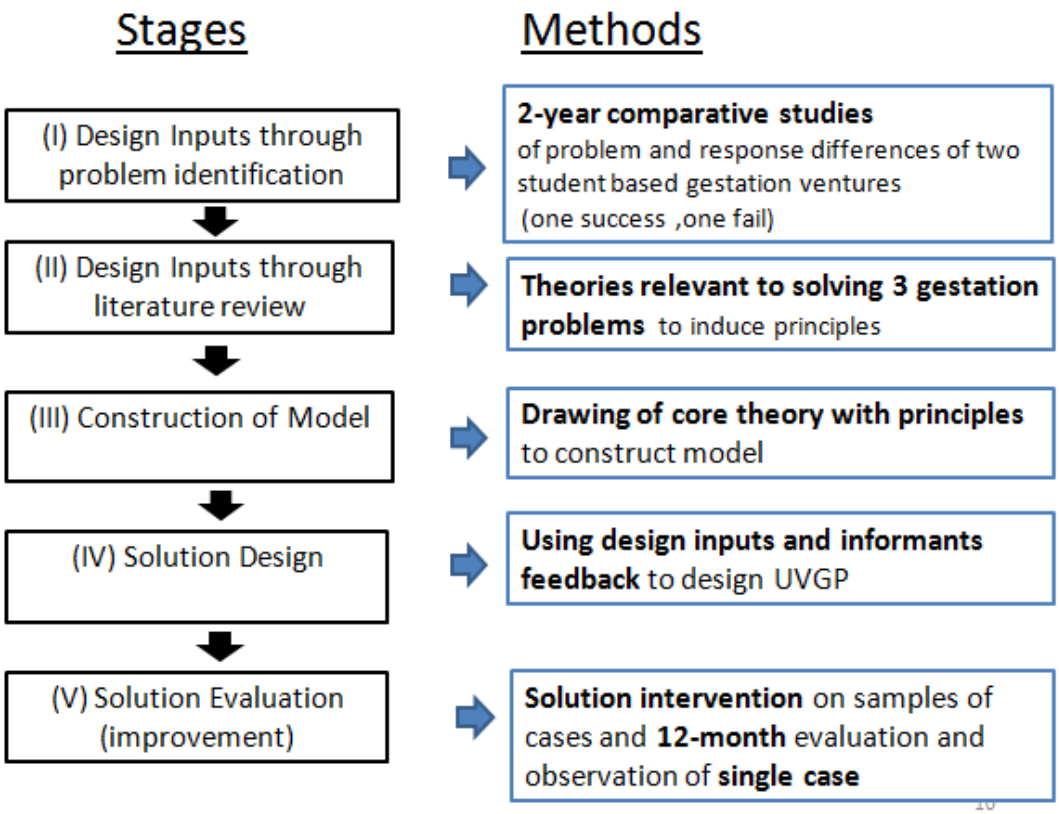
mostly descriptive rather than empirical in nature (Behave, 1994; Reynolds and Miller, 1992; Liao et al., 2005). While pure design science guides actions to solve the problem with a fully designed solution, this research adopts an “emergent” design science approach that serves as a methodology that enables trial and error. The success of this methodology should not be seen as generating full solutions to problems but rather in enabling incremental problem solving strategies and solution improvement. Ultimate solution will be left to the domain of practitioners.

2.2 Process in design science approach

This study adapted the process of design science methodology from Van Aken (2007) and Burg (2007) into five stages (refer to Figure 1). Firstly, the study obtained design inputs through problem identification in longitudinal comparative case study. For the second stage, design inputs were gathered through literature review relevant to the problems. In the third stage, model was constructed by drawing on core theories. In fourth stage, the study combined the inputs with informants’ feedback to construct solution. Finally, the solution was evaluated through intervention on relevant cases in the final stage.

Fig 1: Process of design science method on venture gestation

(Van Aken, 2007; Burg, 2007)



2.2.1 Design inputs through problem identification

In order to derive the initial design inputs, the study identified key problems that the solution should tackle. The study utilized a longitudinal comparative study of two student-based gestation ventures, with one successfully incorporated as venture and the other ceased gestation midway.

Two student-based gestation ventures were chosen from University of Brawijaya (UB), Indonesia, among a cohort of observable cases within the participating universities in Asia. The sample selection allowed researchers to compare teams that were similar in determination and competence. It presented a unique advantage as gestation stage

ventures typically include novices and members that were not fully committed, a fact that renders variables difficult to control.

The other strength of this research design was that the venture can be observed at its early pre-birth stage. The author began to observe these gestation ventures from their early formative stage and followed gestation over an average period of 18 months. Exclusive access to the data allowed in depth research on these cases. Most studies on venture gestation appeared to adopt retrospective exploration of incumbent ventures to understand their gestation behavior. This had resulted in a lot of bias on issues involved in the gestation process, especially so in the field of entrepreneurship (Katz and Gartner, 1988). In contrast, this study may be significant in that it tried to overcome research constrains and differentiated itself from other existing researches.

Two methods for the data collection process, face-to face data collection and electronic communication, were adopted in this research. As for face-to-face data collection, the author made arrangements to meet with the gestation entrepreneurs as a team for a minimum of two to three times during the gestation process. The first session was counted at the gestation commencement point when the team joined the business plan contest. The subsequent sessions were conducted on a quarterly basis throughout the gestation. The final session was conducted at the point when gestation activities were either completed or terminated.

Conversation was adopted instead of a formal interview method. Each conversation lasted for an average of sixty to ninety minutes per session. This method was recommended in that it engaged participants effectively and allowed clarity when identifying the views of the participants on gestation phenomena.

2.2.2 Design inputs through literature review relevant to problems

To derive further design inputs, the study conducted literature review relevant to the problem and the preparation to the solution. The comparative cases discussed in the following sections revealed varying responses to three specific problems that the gestation ventures shared. These problems were regarded as probable causes that determined the outcome of success or failure of the respective ventures. A review of literature bearing on the three problem areas was carried out to grasp the extent of the problems and induced principles helpful in developing remedies. In addition, literature on dynamic capability was examined in pursue for the design solution.

2.2.3 Construct of model

Based on the design inputs from key gestation problems and related literature reviews discussed above, the research team developed and implemented the Venture Gestation Model (VGM) using three principles derived from dynamic capability theory. Through the 3 issues derived from case study comparison and existing literatures provided explanation on the phenomenon of venture gestation success.

2.2.4 Solution design

Based on the designed inputs of the problems faced by two case studies and the literature review, the research team set out to design a solution that would improve the likelihood of gestation success.

This was done in two steps. The first step was to develop a conceptual model, consisting of the key principles of the actual design. The second step was to progress the conceptual model into a concrete educational program, known as the University-based Venture

Gestation Program (UGVP). Content was designed and embedded within the existing university entrepreneurship activities, such as the online business plan workshop, business plan contest and onsite incubation.

The context of the online educational workshop and business plan contest was the shared online environment that enabled educational program to be conducted in real time, using satellite connected infrastructures available in the participating universities. The incubation program was an intensive 3 day-2 night activity, targeted at the contest winning team, run within the incubation center or premises of the local university. The activities involved the discussion and support for the implementation of the business plan by the contest organizer, the entrepreneurship lecturer and incubation manager of the contesting winning team.

The content of the solution was designed by the author, through interviews and in consultation with a panel of informants. The informants included Director of SOI Asia Business Platform, entrepreneurship lecturers and incubation managers in SOI Asia university network, industrial partners from Japanese consultancy firms, and alumni of student participants in the SOI Asia business plan contest. In addition, the educational case studies were created through the joint effort between the author and the selected student-based gestation ventures.

2.2.5 Evaluation of solution

UGVP was applied to the winner of the 2014 School On Internet (SOI) Asia Business Plan Contest. By coincidence, the winner was again from the same university as the earlier student teams that had formed gestation ventures. The champion served as an ideal test case to evaluate the effectiveness of the model. Furthermore, in-depth case analysis provided a good opportunity to conduct controlled evaluation.

CHAPTER 3: DESIGN INPUTS THROUGH PROBLEM IDENTIFICATION

The initial design inputs were derived from problem identification using a longitudinal comparative study of two student-based gestation ventures, with one successfully incorporated as venture and the other ceasing gestation midway.

3.1 Context of student-based gestation venture in School on Internet (SOI) Asia university network

Since year 2007, School on Internet (SOI) University Network started to promote entrepreneurship through organizing annual entrepreneurship workshop, business plan contest and incubation incentives, with the goal of cultivating entrepreneurial students, and developing gestation ventures. This paper captured the data with an average of 180 participants with 50 business plans from cutting edge universities from Japan, Indonesia, Malaysia, Myanmar, and Thailand, who joined in the workshop and contest in year 2012 and 2013 (refer to Table 4).

Table 4: List of participating universities for

SOI Asia Business Plan Contest in year 2012 and 2013

S/No	Country	University
1	Indonesia	University of Brawijaya (UB)
2	Indonesia	Institute of Technology Bandung (ITB)
3	Malaysia	University Saints Malaysia (USM)
4	Myanmar	University of Computer Studies, Yangon (UCSY)
5	Japan	Keio University (KEIO)
6	Thailand	Chulalongkorn University (CHULA)

3.2 Comparative case for design inputs

In order to derive the initial design inputs, the study identified key problems that the solution should tackle. Two student-based gestation ventures were chosen from University of Brawijaya (UB), Indonesia, among a cohort of observable cases within the participating universities in Asia. The two student teams were both champions in the School On Internet (SOI) Asia Business Plan Contest, organized by the author in both 2012 and 2013. They were selected from an average of 50 student venture teams from the participating Asian universities. The two champion gestation ventures were chosen by an independent panel made up of entrepreneurship academics from the participating universities and industrial practitioners from Japanese corporation. They were evaluated based on four criteria: entrepreneurial mindset, business model, future financial forecast, and investment attractiveness. The sample selection allowed researchers to compare teams that were similar in determination and competency. It presented a unique advantage as gestation stage ventures typically include novices and members that are not fully committed, a fact that renders variables difficult to control.

The two cases show similarity in terms of team background, institution and environmental factors, a similarity that is a requisite for the purpose of comparative analysis. It allows the study to identify key success and failure determinants for gestation ventures. Table 5 summarizes the cases.

Table 5: Similarities among the gestation ventures for case study approach

Code name	Gestation venture N (Successful case)	Gestation venture K (Terminated case)
Origin of business idea	Business Plan Contest winner 2012	Business Plan Contest winner 2013
Proposed business	Medical information system for medical institution hospital	Wireless diabetes treatment equipment for medical patient
University	University of Brawijaya (Indonesia)	
Goal	Solution in medical field	
Passion	Assessed to be high	
Educational level	Undergraduate level	
Venture experience	None	
Entrepreneurship education	Received similar educational content	
Gestation timeline	Jan 2013-Jan 2015	Jan 2014-Mar 2015
Gestation duration	24 months	15 months
Final Stage of Gestation	Venture institutionalized stage (Jan 2015)	Termination stage (Mar 2015)

3.3 Case study I: gestation venture N

3.3.1 Background of gestation venture N

Student-based gestation venture N was formed by a group of 5 students from the University of Brawijaya (UB), Indonesia, in October 2012. The 5-member team was made up of third year undergraduate students from different faculties within Brawijaya University, such as medical, information systems, and mechanical and business departments. They proposed to create an integrated medical information system to improve the efficiency of processing medical records at a medical institution. The long-

term plan was to have a shared database integrate these records with those of all medical institutions in Malang city, Indonesia (refer to Table 6).

Table 6: Chronological gestation activities of gestation venture N

Venture Time	Gestation Activities
Jan 2013	Won champion of SOI Asia Business Plan Contest
Jan- Mar 13	Preparation and actual field trip to Japan as contest champion prize
Mar –Aug 13	Research for resource and gestation environment for implementation
July-Aug 13	Exit of members in founding team
Aug – Sep 13	Join the research contest organized by Ministry of Trade, Indonesia
Sept 13– Nov 2014	Formation of 2nd generation management team
Jan- April 14	Preparation and completion of academic thesis based on medical information system project
Oct- Nov 14	Preparation and completion of educational case study based on venture gestation
Jan 2015 onwards	Establishment of venture

3.3.2 Gestation problems faced by gestation venture N

By mid of 2013, gestation venture N began to encounter challenges that threatened the continuity of the venture gestation process. Firstly, within the five-member entrepreneurial team, four members had diverted their commitment and priority towards their individual academic and career development and drifted away from venture gestation activity. Mr. B was selected to join an internship in Japan, while Ms. I began to be busy with her medical internship as well as her marriage plan. Mr. E's engineering competency in designing a hardware sensor for the information system was not required until the next gestation phase, while Mr. Q, the financial officer, had no immediate financial tasks at the early stage of venture gestation. Eventually, Mr. A, the Chief Executive Officer (CEO),

who possessed the ability to create an information system, was the only committed person left to research and implement the next gestation phase.

The second problem faced by the venture was the lack of essential competencies needed for the creation of the medical information system. Mr. A, CEO and lone member of the venture at the mid gestation stage, possessed only basic, undergraduate programming skills. However, the nature of medical information required a higher level of knowledge and skills that would allow design and construction of a market-ready medical information system.

Lastly, gestation venture N had difficulties getting access to a medical institution for research and development required at the next gestation phase. In their original proposal, the team had targeted Brawijaya University hospital, as it is affiliated with the university, as well as Saifu Anwar Hospital, a public hospital in Malang City. However, they could not get access to those hospitals with their proposal. Thus, the gestation venture could not proceed with research and product development.

3.3.3 Reponses formulated by gestation venture N

In order to overcome the problem of diminished team competency, the CEO, Mr. A, recruited three new members from the information systems faculty where he was studying. Mr. R and Mr. Z joined the CEO to form the core research and development team. Thereafter, they used their programming skills to write the programs and interface for the information system. Ms. D, another new member, contributed her expertise in database management by designing the medical database plan for the system. The three new members stayed throughout the research and development phase until the gestation activity was completed after four months (see Table 7).

Next, gestation venture N was able to sign a memorandum of agreement with Brawijaya University Polyclinic on September 2013 and gain access to its medical environment to study and develop the team's new information system. Initially, Mr. A developed a research proposal based on the existing business plan and submitted it to a research plan competition organized by the Ministry of Trade, Indonesia. The incentive was a sum of funding needed to pay for minimum software, hardware and running cost of the operation during gestation activity. A memorandum of agreement was signed between Mr. A and Brawijaya University Polyclinic, and gestation venture N continued its research and developed the planned medical information system. The system was validated by the directors of the institution and endorsed for pilot launch in mid-2014. Eventually, the polyclinic agreed to adopt the information system created by gestation venture N as its new system for outpatient consultation and payment processing.

Table 7: Background and gestation role by members in gestation venture N

S/ N	Name	Period of collaboration	Duration	Academic level	Academic background	Role	Competency	Reason for leaving
1	Mr. A	Jan 13-Dec 14	24 mths	3rd	System information	CEO	Software Develop.	Stayed
2	Mr. B	Jan–June 13	6 mths	3rd	Medical	Operation	Software Develop.	Internship
3	Ms. I	Jan-June 13	6 mths	3rd	System information	Marketing	Hospital liaison	Marriage and studies
4	Mr. Q	Jan-June 13	6 mths	3rd	Economics	Finance	Finance	Studies, lack of role
5	Mr. E	Jan-June 13	6 mths	3rd	Mechanical	Technology	Hardware	Studies, lack of role
6	Mr. R	Sept 13-Apr 14	8 mths	3rd	System information	R&D	Programming	Stayed
7	Mr. Z	Sept-Dec 13	4 mths	3rd	System information	R&D	Programming	Gestation ends
8	Ms. D	Sept-Dec 13	4 mths	3rd	System information	Admin	Database	Gestation ends

3.3.4 Outcome of gestation venture N

Gestation venture N has achieved gestation success by achieving the tangible and intangible outcomes (refer to Table 8). It was incorporated as a legal venture in January 2015.

In terms of tangible outcome, gestation venture N created a completed information system that has been validated and put into used by the university polytechnic. Secondly, CEO is the original members from founding team, and 3 other member from second generation at the end of the gestation. At the point of venture establishment, it attracted any 3 new members. For the third criteria on financing, it successfully raised USD 800 funding, sufficient for the development of prototype. There was no additional initial setup funds required as they did not invest on any fixtures.

For their intangible outcomes, gestation venture N has possessed the competency needed to recreate the same product or with other configuration as the key technological members were remained, Finally, they have accumulated strong track records, which included the winning of contest Champion in SOI Asia Business plan Contest 2012; winner for Research Plan competition organized by Ministry of Trade, Indonesia in 2013; and also most importantly, a contractual memorandum of understanding signed between the university polytechnic and the CEO of gestation venture to sign as the team for the development of the system.

Table 8: Success gestation outcomes by venture gestation N

Outcome	Indicators	Outcome	Conditions
Tangible outcome	i. With a completed prototype validation from end user as an acceptable outcome.	Completion of a medical information system prototype, with validation and adoption by University polytechnic	Achieved
	ii. With minimum of one or more original members from founding team students at the end of required gestation.	CEO is the original members from founding team, and 3 other member from second generation at the end of the gestation	Achieved
	iii. With minimum or above funding amount raised equivalent for the development of the required prototype (without other operating cost, eg salary or office space).	Successfully raised USD 800 funding, sufficient for the development of prototype	Achieved
Intangible outcome	iv. With competency to replicate same or similar product/prototype by remaining members	The remaining member possessed the competency to replicate and develop the same or similar product	Achieved
	v. With relevant track records of gestation formal recognition or endorsement by reputable party on gestation outcome	Champion for contest in Asia 2012 Finalist for research contest by Ministry of Trade (Indonesia), 2013 Signing of MOU with University Polytechnic	Achieved

3.4 Case study II: gestation venture K

3.4.1 Background of gestation venture K

Gestation venture K, just as N, was formed by a group of five undergraduate students at the University of Brawijaya (UB). Within the five–member management team, four were from the Faculty of Electrical Engineering and one from the Faculty of Economics. In its business plan, gestation venture K proposed to create a diabetes therapeutic medical device, which could heal bacteria infected wounds without the need for amputation, rather an innovation in the medical engineering field.

The five members of gestation venture K joined the SOI Asia Business Plan Contest in 2014. Their business plan was selected as the champion team out of fifty business plans competing from other cutting edge universities in Asian. Subsequently, they set the gestation goals on the research and design of antenna and oscillator, which are pertinent components for the medical device (refer to Table 9).

Table 9: Chronological gestation activities of gestation venture K

Gestation period	Gestation Activities
Oct 2013 - Jan 2014	Won champion of SOI Asia Business Plan Contest
Jan - Feb 2014	Planning for gestation
Mar - July 2014	Proposal for product development
Aug 2014	Cease of R&D
Sept 2014	Departure of members in founding team
Nov 2014	Preparation and complete educational case study based on venture gestation
Dec 2014	Contribution of enhanced R&D with prototype to university Ceased gestation activity
Mar 2015	Ceased intention on venture gestation

3.4.2 Gestation problems faced by gestation venture K

Gestation venture K encountered three major problems amidst the gestation process. The first problem was the lack of competencies among members in effectively designing the antenna and oscillator for the needed device. During the initial six months of gestation, the gestation venture consulted Japanese experts for product development and packaging design. Members became aware of their limitations in wireless methodology and were unable to succeed with the design of the medical apparatus. According to the Japanese product expert, the team would have required one or two years to master the skill needed to fully create a prototype based on the chosen methodology. Thus, the gestation venture concluded that they did not possess adequate capacity to advance the gestation activity.

The next problem encountered was the unforeseen exit of founding team members. The original team of five had shrunk to two by August 2014. Three members had to leave the gestation venture as they had accepted permanent job offers at some large Indonesian corporations. The remaining members were Mr. F, the CEO, and Mr. D, the finance officer. None of them were proficient to continue the gestation activity in view of inadequate competence and manpower.

The third problem that the gestation venture encountered was a limited environment for research and development, which made it difficult to fully produce a minimum prototype of the envisaged device. Neither the venture members nor their parent university possessed the instruments necessary to conduct design and testing based on their methodology. Moreover, they could not get direct access to the medical environment needed for research and development of medical equipment.

3.4.3 Responses formulated by gestation venture K

The remaining members of venture K did not take action to replace the members they had lost. In addition, Mr. F, the CEO, who was not technically inclined, chose to work in isolation on the emerging prototype. The other remaining member, Mr. D, who found his financial competence being irrelevant, lost motivation and did not actively participate in the gestation activity, though he was one of its founding members (see Table 10).

Table 10: Background and gestation role of members of gestation venture K

S/ No	Name	Period	Duration	Academic level	Academic background	Role	Competency	Reason for leaving
1	Mr. F	Jan 14-Mar 15	15 mths	3rd	Electrical	CEO	Management	Stay
2	Mr. Y	Jan-Sept 14	9 mths	3rd	Electrical	Technology	Oscillator	Job
3	Mr. K	Jan-July 14	7 mths	3rd	Electrical	Marketing	Antenna	Job
4	Mr. R	Jan-July 14	7 mths	3rd	Electrical	Information	Design	Job
5	Mr. D	Jan-Dec 14	12 mths	2nd	Business	Finance	Fund raising	Inactive

3.4.4 Outcome of gestation venture K

Gestation venture K did not achieved success due to the failure to meet most of the minimum criterion (refer to Table 11). It was declared to have completed ceased gestation without intention for continuation by the CEO on March 2015.

In terms of tangible outcome, gestation venture K did not complete the development of diabetes therapeutic medical device. The remaining prototype was handed over to faculty members in the university. Secondly, there was not member left as CEO, the remaining members has also decided to cease his continuation of the gestation. Thus gestation venture K has left no members at the point of transition. Next, there was no

funding received, other than material used from the university. No indication of financing effort could be accounted as part of gestation outcome.

For their intangible outcomes, gestation venture K did not have any member who possessed the competency needed to replicate the expected product due to incompletion of product development. The only intangible outcome is the track records as the contest champion in SOI Asia Business Plan contest in 2014.

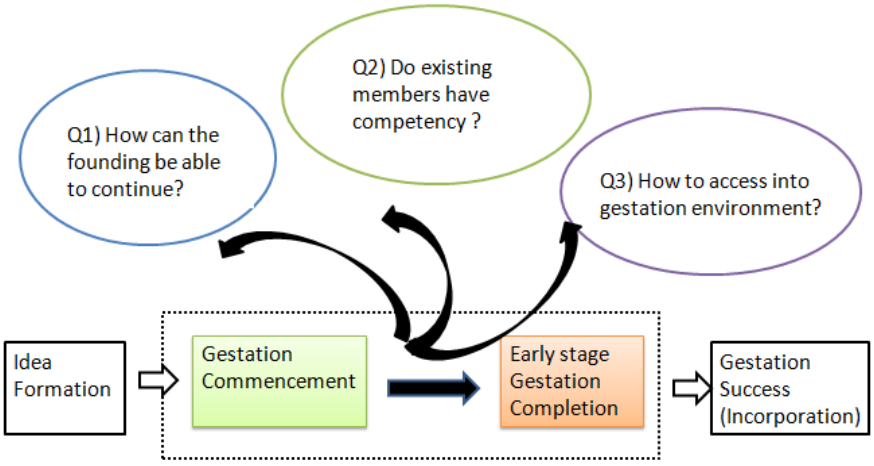
Table 11: Unsuccessful gestation outcomes by venture gestation K

Outcome	Indicators	Outcome	Condition
Tangible outcome	i. With a completed prototype within validation from end user as an acceptable outcome for consumption.	Incomplete development of diabetes therapeutic medical device handed over to faculty members	Not achieved
	ii. With minimum of one or more original members from founding team students at the end of required gestation.	CEO is the original members from founding team at the end of the gestation	Achieved
	iii. With minimum or above funding amount raised equivalent for the development of the required prototype (without other operating cost, eg salary or office space).	Did not raise any additional funding	Not achieved
Intangible outcome	iv. With competency to replicate same or similar product/prototype by remaining members	Remaining member did not have the competency to replicate r develop the same or similar product	Not achieved
	v. With Relevant track records of gestation Formal recognition or endorsement by reputable party on gestation outcome	Champion for contest in Asia 2014	Achieved but sufficient enough

3.5 Identification of key gestation problems

The findings from the comparative analysis revealed the similarities and differences of the two student based gestation ventures. The similarities were explained as the non-causing factors, while the differences signified the prevailing issues that threatened the gestation process and the responses undertaken by the gestation ventures. The three problems identified and observed are (i) instability of founding team, (ii) inadequate competencies, and (iii) failure of access into required gestation environment. The below figure 2 and paragraph entailed the descriptive data of the prevailing key issues faced, with responses and outcome differences by both gestation ventures N and K.

Fig 2 : Three key problems faced by gestation ventures



3.5.1 Instability of founding team

Both student gestation ventures encountered the problem of pre-mature departure of founding team members. The discontinuity of gestation venture members occurred within the first six to nine months of the gestation process. The members left due to personal reasons, such as internship, employment and insufficient skills. Both ventures made a similar experience in having only one committed and remaining member, who happened to be the CEO of the respective teams. Both gestation ventures assumed that the

founding team members would stay till the gestation was completed and beyond. While gestation uncertainty can be partly accounted for by external environmental factors, the internal matter of losing founding members was thought to be more disruptive.

Observation shows that gestation venture N responded to internal instability by recruiting new members as a second generation team. According to Mr. A, the CEO, the three newly appointed members were recruited based on two criteria, level of commitment and anticipated duration of gestation activity. The three members were not expected to stay permanently. Instead, they were recruited for the next four months to perform the needed research and development tasks. Secondly, Mr. A emphasized that the new members were not just performing operational roles but were directly involved in idea creation and decision making leading up to system design. He also assured end users that the results of the gestation venture would be satisfactory to them. In Mr. A's view, an improved recruitment strategy as well as his validation with end users contributed much to the final success of venture gestation.

On the other hand, gestation venture K did not take any action regarding the recruitment of new members for the management team. The remaining team members viewed the innovative ideas of the venture as an asset of its founding stage, and were not ready to involve new members to take over its tasks. In addition, Mr. F was also concerned that new members might adversely affect team work and cooperation.

3.5.2 Inadequate competencies

With members departing from the teams neither venture had adequate gestation competencies for research and development. The core of their business plans was to create some form of innovation relying on their own product research, development and validation. However, the ideas of the teams, one a medical information system, the other a medical device, were complex in nature and not within the competency of undergraduate

students to accomplish. This explains the necessity, or rationale, of building a team that not only possesses or is able to acquire the competencies necessary for gestation but is also able to also take gestation to at least a minimum expected level.

Observation shows that gestation venture N responded to inadequate competencies by focusing more sharply on skills required by its second generation team. Mr. A identified the competency gap facing the task, such as in interface design and programming and database management. Next, he searched within his social network for potential members who might possess these specialties. With three new members picked for the team, Mr. A was then able to complete the gestation activity base.

Within the development of the venture's information system, Mr. A was responsible for more than half of the entire gestation tasks. He delegated the remaining tasks to the new members, individually allocating research and development, programming and database management. He imparted some of his programming skills to the new members, who were less proficient than him. Other competencies needed for system customization and the integration of medical end users, such as doctors and medical document administrators, were acquired through "on-the-job" learning, especially through interviews, feedback and validation by end users.

On the other hand, gestation venture K could not find a way to address competency needs and complete gestation. Mr. F himself did not understand the composition of skills needed for the complex methodology involved. He himself admitted that he was not technically inclined. Secondly, he did not actively search for new members who might have possessed the required competencies, which finally spelled the end of the gestation venture.

3.5.3 Failure of access into gestation environment

Both, gestation ventures N and K had problems accessing the gestation environment needed to continue research and product development and complete gestation with end-user validation.

In the case of gestation venture N, the business plan was to create an internal information system for a medical institution. Thus, the gestation venture needed access to the patient-processing environment of an authorized medical institution, where they could study the processes required for outpatient medical consultation and payment. In addition, they needed research funding for the purchase of minimum software and hardware for the development of the information system. The response of gestation venture N shows that it was able to seize on the opportunity of a research plan competition to gain funding to support research and development of the gestation prototype. Venture N bundled and reconfigured venture-owned resources into a strong proposition, which convinced Brawijaya University Polytechnic on the team's readiness and credibility. The team presented their business plan as a research and development plan, which became the winning entry in the competition and gained the research team funding of USD800 dollars. Next, they acquired a letter of recommendation from the university rector, who was convinced by their performance due to their track record as previous champion in the business plan contest. As the team customized their research plan for Brawijaya University Polyclinic, the earlier track winning record and the available research funding were included in the plan to prove their readiness and attractiveness as a gestation venture. Eventually, the gestation venture was able to successfully sign the memorandum of agreement with Brawijaya University Polyclinic.

On the other hand, gestation venture K failed to formalize any access rights that would have enabled continued gestation. They only managed to conduct a few informal visit and interview sessions with academics and students from the medical faculty of the University of Brawijaya but failed to arrange for any formal collaboration with medical staff.

In addition, the data gathered through the interview sessions was unstructured and tacit, and could not be applied to prototype making.

Thus, observation highlights the importance of a gestation venture's ability to reconfigure its valuable tangible resources such as its business plan or funding, as well as its venture-specific intangible resources such as its past track record and affiliation with a parent institution in order to gain access to the desired external gestation environment.

3.5.4 Similarities between two gestation ventures

The study compares and draws differences between the two student-based gestation ventures that explained the gestation outcome difference, while the similar factors signified as possible non-causing factors. There are four levels of control variables are identified from the comparison of cases. They are environmental level, organizational level, team level and individual level, which are important in the analysis (refer to Table 12).

Firstly, at the environmental level, both gestation ventures originated from Indonesia, and members received education from University of Brawijaya. Next, at the organizational level, both business proposals addressed innovation to solve medical needs; possessed a highly appraised business plan at the junction of venture gestation commencement. At the team level, both team have 5 members. Furthermore, at the Individual level, members from both gestation ventures were similar in age range, between 18-24 years old; undergraduate level, between year two to year four at the point of venture gestation; received same entrepreneurship education, with no prior experience in venture gestation.

In considering the above similarities, the study focuses to examine on other factors that may be the cause to explain for the differences venture gestation outcomes by the gestation ventures.

Table 12: Similarities as control variables between the gestation ventures

Level	Variables	Gestation venture N	Gestation venture K
Environmental Factors	Country	Indonesia	
	University	University of Brawijaya	
Organizational factors	Business Industry	Solution in medical field	
Team Factors	No of members	5 members	
	Stage of gestation	Created business plan and won as contest champion	
Individual Factors	Educational level	Undergraduate level	
	Entrepreneurship education	Received similar educational content	
	Venture experience	None	
	Motivation	Assessed to be high	

CHAPTER 4: DESIGN INPUTS THROUGH LITERATURE REVIEW RELEVANT TO THE PROBLEMS

In order to derive further design inputs for the solution, the study conducted literature review relevant to the problems of venture gestation. The above comparative case study shows up three problems faced during venture gestation and points to the necessity of finding ways to overcome these problems. This implies that gestation success can only happen if there are effective responses to the issues encountered. The effective responses need to be guided by firm theoretical foundations in the hope of creating a solution model that can be generalized and applied to all future gestation ventures.

4.1 Theories related to causes of gestation failure

Prior literatures primary focuses on the determinants of gestation success, which inversely signified causes of gestation failure, if without any of the studied factors. According to the two approaches on the study of venture gestation (Liao et al., 2005), namely the stage based approach and activity based approach, the factors that leads to the success or failure of gestation are different due to the chosen perspective.

Firstly, based on the stage based approach, Katz and Gartner (1988) suggested four essential properties that indicated the success or failure of a venture gestation. These properties include the intention to create an organization; efforts in boundary establishment activities that distinguished the venture from the rest of the world (such as incorporation, partnership/management agreements, the establishment of physical offices, and a phone line); the acquisition of financial resources for venture setup; and the contacts with external stakeholder, such as suppliers and customers, culminating with initial sales and/or initial hiring. Galbraith (1982) proposed a 4-stage model, which include

(i) a proof-of-principle stage in which the gestation venture creates an idea to develop some proprietary technology; (ii) a prototype development stage; (iii) a model shop stage in which a number of models are produced and tested; (iv) the start-up stage in which formal production begins and the firm makes its first sales. Venture gestation trajectory would be hindered if any of the stage criteria is not met, and will likely to result in a gestation failure outcome.

On the other hand, activity based approach examines the activities, milestones, frequency and timing of the activities (Carter et al. (1996), Gatewood et al. (1995) and Reynolds and Miller (1992). Reynolds and Miller's (1992) research explained that as the number of gestation activities increase (i.e., commitment of personal time and resources, receipt of outside financial support, hiring of employees, and first sales), it will decrease the probability of gestation failures. Using the behavioral theory, Gatewood et al. (1995) found what differentiates a successful and failure gestation venture are due to activities related to setting up business operations, such as purchasing raw materials, hiring employees, producing the product/service, and distributing the product. Carter et al. (1996) examined three groups of samples, successful start-ups, works in progress and failed start-ups, and derive three specific activities, namely purchase of facilities and equipment, receipt of financial support, and development of model and prototypes as the cause of gestation success.

However, the limitation of the prior literature assumes that gestation is linear, whereby combination of activities will lead to the creation of new venture, without analyzing the problems that lead to the cause of the activities. Thus, it give rise to the evolutionary approach to observe a nonlinear gestation through the study of venture behavioral responses in order to induce factors that are understudied yet imperative toward resolving the problems for venture gestation.

4.2 Theories aimed at resolving gestation problems

4.2.1 Theories related to instability of founding team

Past researchers studied the notion of team based tenure as a factor within team structure of top management and its effects on organizational performance and productivity (Keck and Tushman, 1993, Janis and Mann 1977, Williams and O'Reilly, 1998).

According to Keck and Tushman (1993), tenure refers to the duration of an individual or group of individuals holding a title or position in an organization. The notion of tenure has been studied at both team level and individual level. Team based tenure is defined as the duration of one and the same group of individuals working together as a team in an organization, whereas individual based tenure refers to the duration of individuals holding a title in the organization.

Research focuses on the effectiveness of tenure duration in relation to organizational performance. In terms of tenure duration, new team may take at least six months to become productive (Gabarro, 1987) and develop shared values (Hambrick and D'Aveni 1992) and increase communication (Janis and Mann, 1977). Productivity increases as the team members familiarize themselves with team interaction patterns and develop cooperation with one another. However, a "long tenure" has lesser favorable implications for organizational performance success. Shorter-tenured teams are found to provide the skills needed to address environmental complexities and will be more productive in turbulent environments. Katz (1982) argued that if the team tenure was too long, the organization would suffer from inflexibility regarding internal change and would meet opportunity with inertia.

Another group of researcher focuses on variation of tenure duration and impact on organization. Team based tenure can be said to be constant when the same team members work together for the same given period of time to accomplish a certain task within it. On the other hand, tenure is varied when a shortening or extension of tenure duration occurs. According to findings by Wagner et al. (1984), exit from and entry to a working team in an organization may cause variations in team based tenure. The outcomes might be differences of working attitudes, decrease in communication and increase in team conflict. On the other hand, Keck and Tushman (1993) argued that team based tenure may also vary in order to meet the needs of an unstable external environment. Their findings showed variation in team tenure leads to an increase in financial performance under turbulent external conditions.

4.2.2 Theories related to inadequate competencies of existing members

Regarding the issue of inadequacy of competencies, the literature on the concept of core competency must be discussed. Introduced by Prahalad and Hamel (1990), core competency is defined as a form of competency that differentiates a company strategically from others. The authors highlighted core competency in terms of collective learning and the coordination of diverse skills with technologies. It is a more superior competency in terms of direct effects on variables such as customer benefit, uniqueness and inimitability, as well as accessibility to different markets (Prahalad and Hamel, 1990). Scholars agree that the notion of competency resides in every member of an organization, which means it is cumulative and hierarchical in nature.

Organizational learning theories (Pawlowsky, 2001) give us concepts to get an understanding of the development of strategic processes (Mintzberg, 1999) through patterns of interaction among the members of an organization (Minzterg, 1978, Noda and Bower, 1996). Organization learning can be considered at two levels, the individual and organizational level.

Crossan and her team (1999) focused on the individual level to look at the process of core competency development. They studied various modes of learning, for example intuition, experience, interpretation and co-learning, which form the collective mind and produce action. On the other hand, Pawlowsky's learning model (2001) focused on the collective effort at the stage of integration and action, i.e., when applying knowledge gains to the creation of new products, processes, strategies and structure. However, there are little in these studies on how the individual and the collective team in a venture combine different learning methods to gain the knowledge that is required to complete a task.

4.2.3 Theories related to failure of access into gestation environment

Problem of accessing gestation environment can be explained through literature originated from resource and capability perspective. Under the resource based view theory, Penrose's (1959) seminal work provides the basis of evaluating the firms' resource environments and how entrepreneurs may create value in constrained environments. His classic explanation is that firms are idiosyncratic and they will perform differently, even if they possessing very similar material and human resource inputs may offer substantially different sets of services to the market because of differences in their ability to grasp possible uses and combinations of those inputs. Extending Penrose's resource view based theory, Barney (2001) considered about the bundling effects of resource. He argued that business processes that exploited valuable and rare resources could be a source of temporary competitive advantage; and business processes that exploited valuable, rare, and costly-to-imitate resources could be a source of sustained competitive advantage (Barney, 1991). However, they position a static view of resource, which fails to explain from the venture perspective on how organization undertakes to assess and configure the resources. In addition, resource view based theory is inadequate to explain about the survival and occasional success of entrepreneurs who embrace new challenge.

Evolving from resource view based theory, Lévi-Strauss (1967) introduced the termed bricolage, which aligns with notions of resourcefulness in view of a resource constrained organization. The notion of resourcefulness refers to the ability to get and use the resource. However, the theory of bricolage explains "how" resourcefulness is achieved in the context of a resource constrained firm. It emphasizes the concept of "make do with whatever is at hand". The debate of "make do with whatever is at hand" implies a bias toward an action or process motivated pursuit of a problem or opportunity, while neglecting the workable outcome of the action (Baker & Nelson, 2005). Baker et al. (2005) introduced the notion of "entrepreneurial bricolage" which is referred to as "making something out of nothing". The authors introduced a number of bricolage principles including "make do" and the combination of resources for new purposes, using what is at hand. Successful bricolage would enable the organization to manage market, uncertainties and develop, even in resource constraint environment. However, the concept failed to address background factors such as the entrepreneur and his/her environment, whether internal or external, both of which have great bearing on resource accessibility and reconfiguration.

Senyard et al. (2009) explained in their quantitative studies how bricolage "speeds up" the emergence of a nascent firm. However, their work fails to show how and why a nascent venture's internal and external gestation environment might enable it to achieve gestation success. The notion of bricolage in "using what you have" is similar to "exploit what you have" rather than "create what you have and then exploit it". Thus, a wider definition of entrepreneurial bricolage may be in order.

4.2.4 Dynamic capability theory

Other than the literature reviews that insufficiently address the three issues faced by the two gestation ventures, dynamic capability theory provides a theoretical framework that will support the construction of a solution model.

In the early study of understanding the development of organization, resource based view theory was able to explain the heterogeneity of resources and capabilities of different organization, which results in the difference in performance, and competitive advantage (Penrose 1959; Wernerfelt 1984; Barney 1991). Entering the 1990s, the highly dynamic business environment challenged the original propositions of the Resource Based View as being static and neglecting the influence of market dynamism (Eisenhardt and Martin 2000), which gave rise to the study on dynamic capability.

Dynamic capabilities, encapsulating the evolutionary nature of resources and capabilities emerged to enhance the resource based view theory (Teece *et al.* 1992[iv], 1997; Eisenhardt and Martin 2000). Three of the most influential paper are on the research development of dynamic capability are by Teece et al., (1997); Eisenhardt and Martin (2000); Zollo and Winter (2007) in the perspective of strategic management.

Teece et al., (1997, p 516) defined dynamic capabilities as "the firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments." They provided a broad definition and concept for dynamic capability, but also left many questions for further research and discussion among researchers with a different lens and background.

Two most debated schools of thought prevail in dynamic capability. One is the routine view of dynamic capability (Teece, 1997), the other the process view (Eisenhardt and Martin, 2000). Teece (1997) defined routine in the way a firm gets things done as a repeated action sequence made up of algorithms and heuristics. Dynamic capability theory

explains how the routine is formed based on the idiosyncratic nature and specific resources possessed by the firm. But the concept of routine has been criticized as static in nature and unable to respond to the needs of a competitive and changing environment in the organization.

In opposition to the traditional view of dynamic capability, Eisenhardt and Martin (2000) view it as a specific organizational and strategic process. Given this "process view", dynamic capability should be specific, identifiable processes. However, Eisenhardt and Martin narrowly applied dynamic capability theory to the established firm and did not focus on gestation ventures. As a result, their theory offers limited dynamic capability and relevance toward our understanding of organization in the form of venture gestation.

Newbert (2005) extended Eisenhardt and Martin's process view of dynamic capability by explaining it as a process for new venture creation that is caused by the exogenous factors of the market dynamism. He concluded that entrepreneurs do not engage haphazardly in gestation activities, rather they undergo a specific set of activities in an identifiable sequence. They do this through the acquisition and reconfiguration of resources, in order to complete venture gestation (Newbert, 2005, pg 74). Useful as they are, however, the views of both Eisenhardt (2000) and Newbert (2007) do not mention the reasons and conditions by which ventures gain the ability to undertake actions throughout gestation.

CHAPTER 5: CONSTRUCTION OF MODEL

Based on the design inputs from key gestation problems and related literature reviews discussed above, the research team developed and implemented the Venture Gestation Model (VGM) using three principles derived from dynamic capability theory. Through the 3 issues derived from case study comparison, it shows not only the problem faced during venture gestation, but the necessity to have the awareness of the problem. Thus, it implies that gestation success can happen only if there is a response to the issues encountered. On the reverse, if there is not response, it provides great meaning to create a solution model that can be generalizing and apply for all. The reasons for the theory explain the different of this model from other the normal problem solving model. Through the clarity of the study referred to the two case studies and existing literatures to explain the phenomenon of venture gestation success.

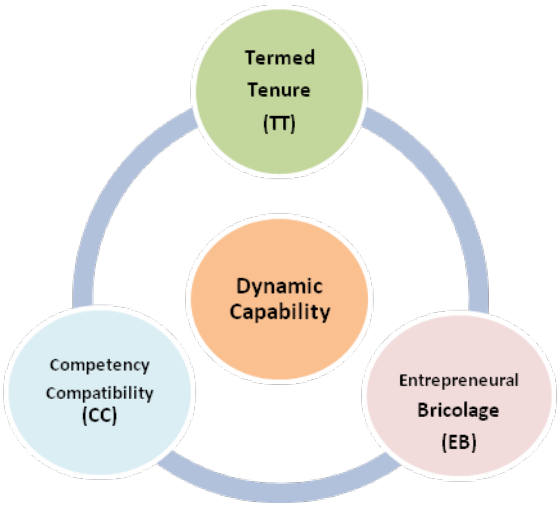
5.1 Venture Gestation Model (VGM)

The notion of dynamic capability is at the center of the model. This study defines dynamic capability specifically as the capability of a gestation venture to create termed tenure structure, to utilize and develop competencies and to access and reconfigure resources from the internal and external environment to successfully complete gestation activities under changing conditions.

Using dynamic capability in the sense defined, we need to address its principles as they apply to the gestation venture team and its members. The first is termed tenure, the second competency compatibility, and the third entrepreneurial bricolage (refer to figure 3). The three principles will be used to explain the treatment of the three key issues faced by gestation ventures, namely (a) instability of the founding team, (b) lack of gestation competencies by existing members, and (c) failure of access to the gestation environment.

In view of dynamic changes how do teams respond to bring about gestation success? In laymen's terms they rely on the organizational ability to self-transform.

Figure 3: Three principles of dynamic capability for Venture Gestation Model



5.1.1 Termed tenure

The first principle addresses the problem of the instability of the founding team. It is the notion of "termed tenure". Termed tenure refers to the organizational structure that defines roles and commitments of a set of individuals to perform and complete given tasks within a specific time frame. The notion of "termed" refers to the conditional undertaking by individuals based on duration, commitment and incentives. Dynamic capability theory is relevant in explaining the behavior of gestation ventures in response to demands placed on team structure under changing environmental conditions. Meeting the demands is essential to the completion of gestation activity.

5.1.2 Competency compatibility

The second principle addresses the problem of existing members lacking gestation know-how. This principle is the notion of “competency compatibility”. Competency is defined as the skills and knowledge needed to solve a problem. The notion of compatibility refers to a state of two of more things able to exist or occur together without problems or conflict. In this study, competency compatibility refers to combinations of competencies among team members. Competency is acquired over time through various learning modes in order to complete gestation activity at a minimum acceptable level. Dynamic capability theory is relevant in this instance in explaining the ability of gestation ventures to respond to competency needs and complete gestation activity under changing environmental conditions.

5.1.3 Entrepreneurial bricolage

The third principle addresses the problem of failure of access to the gestation environment. It refers to the notion of “entrepreneurial bricolage”. Entrepreneurial bricolage is defined as the ability to access and reconfigure existing valuable resources from both external and internal environments for the completion of gestation. Resource valuation is based on the idea of what is rare, inimitable and non-substitutable as defined by Barney (1991). Adapting the definition of bricolage of Baker (2009) and Senyard (2012), dynamic capability theory explains the ability of gestation ventures to create valuable resources and reconfigure them to access and complete gestation activity under changing environmental conditions.

5.2 Application of Venture Gestation Model (VGM) on gestation venture

The following sub-sections will describe the application of the Venture Gestation Model (VGM), which is constructed based on the three principles of dynamic capability theory, on how the gestation venture N overcome the three key issues: (i) non permanence of founding team; (ii) lacking of gestation competencies by existing members, (iii) inability to access the gestation environment, based by both gestation ventures.

Through the study, the model is derived based on the analysis of the two cases. It is not to prove the external validity, or explain the generalizability, which is consistent with the evolutionary theory. However, through this research effort, a consistent model can be proposed for resolving the arising key gestation issues based on the case analysis method.

5.2.1 Creation of "4-month" second generation team through termed tenure principle

Through the principle of termed tenure for the team, gestation venture N created the second generation team to overcome the non-permanence of founding team members problem, and completed the gestation activity (refer to Table 13). Gestation venture N recruited the new three members by specifying the four months tenure duration, the role and duties for individual and team, their goal to complete the activity as part of the venture gestation process. Instead of monetary incentives, 3 members were persuaded by the meaningful purpose of the project and understand that their roles will contribute to the improvement of medical system for patients in their known community. Beyond the four months, two of the members, Mr F and Mr R continued to extend their service in the gestation venture for another three months to complete the prototype validation of the created medical information system from Jan till Mar 2014 under a new termed tenure for as a "new" team.

Table 13: Termed Tenure of gestation venture N

S/N	Structure	Manpower	Source	Duration	Timeline duration	Gestation Phase	Activity	Short Term output
1	2nd generation	4 pax	Internal (Uni Electrical Dept.)	4 mths	Oct-Dec 13	Prototype creation Phase	To interview the hospital To write program To setup database	Complete gestation activity with product validation and adoption by the polyclinic
2	2nd generation (beyond)	2 pax	Internal (Uni Electrical Dept.)	3 mths	Jan-Mar 14	Prototype Validation Phase	To test the system To conduct review To improve and do retesting	

Based on the above analysis, the study derived the hypothesis of using principle of termed tenure as the method for achieving the outcome of gestation completion by solving the venture issues of non-permanence of founding team (issue one) and inadequacy of competency by remaining members (issue two).

5.2.2 Learning through gestation solution under competency compatibility principle

Through the principle of Competency Compatibility, gestation venture N adopted “On the gestation learning for partially competent members to overcome the lacking of competency by existing members (refer to Table 14). Next, the new members of gestation venture N were recruited with “partial” competency adequate to accomplish their given task. However, the members relied on various learning methods to increase the competencies needed for the creation of medical information system through the gestation process. Based on the various learning method, co-learning method and on the job learning method were the most dependent learning method for the completion of the task in the gestation activity. On the other hand, the least dependent source of

competency is the “individual’s background”, or so called competency acquired from university academic learning. All members in N nascent venture could not relied on their background as their academic competencies were too theoretical and inadequate for carrying out the actual gestation activities.

Table 14: Competency Compatibility of gestation venture N

S/N	Name	Role and Task			Gestation Learning Methods				Output and validation		
		Academic Background	Role in Venture	Individual	Academic learning	Co-learning	Job learning	Self-learning	Output	Rating by CEO	Rating of Product by hospital
1	Mr A	Information System Program	CEO	Program	20%	20%	30%	30%	Oversee and created the entire system (Completed)	Self	Above average To be officially used for the polytechnic
2	Mr R	Information System Program	R&D	Program	10%	40%	40%	10%	Created financial module Create design interface (Completed)	High	
3	Mr Z	Information System Program	R&D	Program,	10%	45%	25%	15%	Created the registration module (Completed)	Mid	
4	Ms D	Information System Database Mgt	Administration	Database Management	10%	35%	45%	10%	Created the Database (Completed)	Mid	
		Means of learning mode			12.5%	35%	35%	16.25%			

Based on the above analysis, the study derived the hypothesis of using principle of competency compatibility as the method for achieving the outcome of gestation completion by solving the inadequacy of competency by remaining members (issue two).

5.2.3 Resource bundling using entrepreneurial bricolage principle

Through the principle of Entrepreneurial Bricolage, gestation venture N created valuable resource “by gestation” and reconfigure the resource by bundling them “for gestation”, to solve the problem on accessing into gestation environment (refer to Table 15). The method of resource valuation applied were based on Barney's (2001) "V.I.R.N" concept of valuation of resources. Under the concept, resource that is classified to be valuable (V), inimitable (I), rare (R) and non- replaceable (N), will be highly valued due to its effects on the competitive advantage of firm.

Firstly, gestation venture N utilized their earlier created business plan from contest to formulate it into a research plan, and awarded with USD800 as research funding. The funding was considered “high value” for gestation purpose, in terms of the purchase of essentials software and hardware required for the research and development of medical information system. In addition, the nascent venture utilized their network support in two aspects. They received the letter of recommendation from Rector of University of Brawijaya. The letter was a strong statement and assessed to be a “rare” resource and high value. The track record of being the champion of SOI Asia Business Plan Contest 2013 was important in giving the venture the credential of recognition by external organization. With the resource bundling, N nascent venture convinced Brawijaya University Polytechnic to sign the memorandum of agreement for the nascent venture to access into the medical environment to conduct their research and create the medical information system.

Based on the above analysis, the study derived the hypothesis of using principle of entrepreneurial bricolage as the method for achieving the outcome of gestation completion by solving the problem of assessing into gestation environment (issue 3).

Table 15: Entrepreneurial Bricolage by gestation venture N

S/N	Bundle component	Resource configuration		Reliance on Network			Value of Bundle	
		Original Resource	Description	Intermediaries	Intermediaries	Source of resource	Rating of Bundle component	Remarks on bundles component
1	Research Plan for UB Poly	Business Plan	Reconfiguration of Business Plan	N	Nil	Nil	High	Inimitable
2	Research Funding USD800	Business Plan	Reconfigure business plan into research plan	Y	Ministry of Trade	External	High	Valuable
3	Recommendation letter from Rector	Business Plan	Affiliation to UB	Y	Rector, UB	Internal	High	Rare
4	Perceptive Competency based on business Plan Champion in Asia	Track records	Champion as SOI Asia Business Plan Contest in Asia in 2013	Y	SOI Asia	External	High	Rare, Inimitable

CHAPTER 6: SOLUTION DESIGN

In order to develop successful gestation outcome for gestation venture by university students, the study developed a design solution as an educational program to forestall the gestation problem faced by student-base gestation venture.

With the background of unbalance of high participation in business plan contest, with few successful venture by university students, and the empirical study of gestation failure through comparative case studies and the literature review, it revealed the need for educational intervention be implemented within the university. University Based Venture Gestation Program (UVGP), has been designed to fill the curriculum and practitioner gaps in entrepreneurship education as a collaborative efforts amongst the SOI Asia University Network. Through the designed solution, results of implementation can be used to improve the program for subsequent application.

6.1 University–based Venture Gestation Program (UVGP)

The University-based Venture Gestation Program (UVGP) extended the Venture Gestation Model into a program aimed at improving chances for student venture success. The objective of the program is met with the following conditions met:

- To increase awareness of problem and learned principles
- To forestall instability of founding team
- To forestall competency inadequacy
- To forestall the inability to access into the required gestation environment

The program consists of three gestation tools, namely (a) Table of Timeline Activity and Manpower planning" (TAM), (b) Table of Task and Competency Compatibility (TCC), and

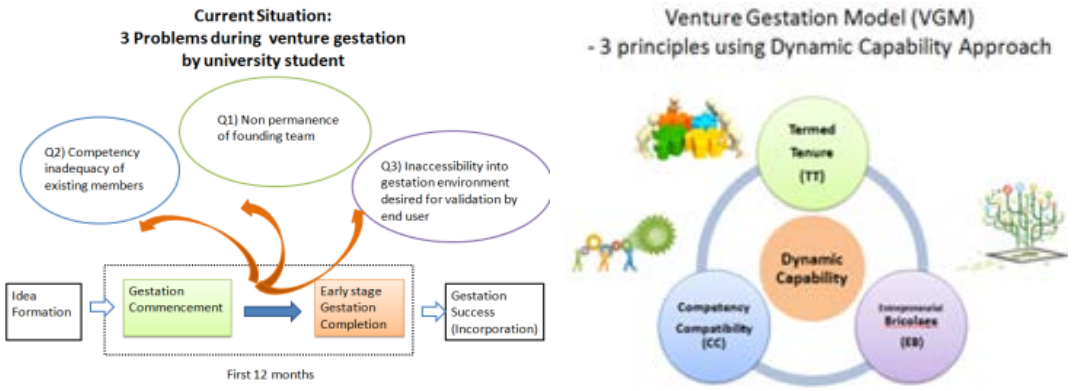
(c) Table of Resource Configuration (TRC). Effects of the program are measured by its ability to overcome the three gestation problems we have encountered.

Table 16 and figure 4 indicate how the gestation problems, design principles and gestation tools (prescriptions) are related.

Table 16: Three prescriptions of University-based Venture Gestation Program (UVPG)

Gestation problems	Design principles derived from literature review	Gestation tools
Instability of founding team	Termed tenure	Table of Timeline Activity and Manpower Planning (TAM)
Competency inadequacy of existing members	Competency compatibility	Task and Competency Compatibility Plan (TCC)
Failure of access to gestation environment desired for validation by end user	Entrepreneurial bricolage	Table of Resource Configuration (TRC)

Fig 4: Prescriptions for University-based Venture Gestation Program (UVGP)



6.1.1 Prescription for forestalling instability of founding team (prescription one)

The prescription consists of the explanation of the problem of founding team instability, the principle of termed tenure, case examples and the application of a gestation tool, referred to as Table for Timeline Activity and Manpower Planning (TAM) (see Table 17).

The purpose of the prescription is to enable the gestation venture to “lock in” the necessary manpower, as a stable team, for the required full time frame. Given TAM, the gestation venture can preclude the sudden exit of core members on the assumption that instability will occur otherwise. TAM is developed as an analytical tool that describes the gestation process, as broken down into a series of sub-gestation activities, which define the required team collaboration events together with associated time frames needed for completion.

The study referred to the construct of team tenure variables and organization performance by Finkelstein and colleagues (1990), Hambrick (1991) and Keck (1997) to develop measurement of termed tenure in “Table for Timeline Activity and Manpower Planning” (TAM). Adapting from Finkelstein (1990), the construct include key components related to encoded data on termed tenure, such as “tenure duration”, “team size”, “team tenure stability” and “gestation”. The encoding of the components explain the detailed planning of the tenure agreed by the team.

For the performance, two components: “strategic conformity” and “gestation output” are used as indicators of performance measurement. Strategy conformity measures the degree in which the stability of termed tenure matches the job completion. The more stable the team tenure, the less disruption towards the job completion. The component of “gestation output” would serve as evidence of effort by the team tenure.

Table 17: Timeline Activity and Manpower Planning (TAM)

Criteria	Answer (Description)
15. Statement on ability of Task and current competencies Please describe the key competencies based on past experience, achievement that are relevant for the action of the business process	

Tenure Planning					Performance	
Schedule	Tenure Duration	Gestation Task	Tenure size	Team Tenure stability	Strategy conformity	Gestation Activity Output

6.1.2 Prescription for forestalling of competency inadequacy (prescription two)

The prescription consists of the explanation on the problem of competency inadequacy, the principle of competency compatibility, case examples and a gestation tool, referred to as Task and Competency Compatibility (TCC) (refer to Table 18). The purpose of this prescription is to help the gestation venture analyze the competencies of existing members with accuracy and with a view to completing the gestation tasks by end of the twelve months. TCC is developed as an analytical tool that describes the tasks required by the gestation activities in relation to the given sources of competencies.

The study referred to the dynamic process of organizational learning framework for individual by Crossan (1999) to develop measurement of competency compatibility in “Table for Competency Compatibility” (TCC).

In the construct, the components to encode the perceived competency compatibility include “gestation venture role”, “gestation Task”, “self-competency evaluation (before gestation)”.The data encoded would provide insights and awareness by team members on the perceived level of inadequacy of competency prior to gestation commencement. Perceived competency compatibility is the difference between the gestation relevant competency possessed by the individual members (evident through the separated individual resume), and expected competency based on the gestation activity.

For the post gestation performance measurement, the construct will include two levels of assessment, “self-assessment evaluation (post gestation) and “assessment by related external stakeholder”, with the supported element of “gestation output”.

Based on Crossan’s theory on effects of organization learning framework on individual competency development, the organization, as a collection of individuals will utilize their intuition of their “inadequate competency” by acquire for the required competency through various learning modes, in order to close the competency gap.

Table 18: Table of Competency Compatibility (TCC)

Criteria	Answer (Description)
15. Statement on ability of Task and current competencies Please describe the key competencies based on past experience, achievement that are relevant for the action of the business process	

S N o	*Name*	*Role*	*Task*	*Self competency evaluation (before gestation)*	*Self competency evaluation (after gestation)*	*Competency valuation by external stakeholder (After gestation)*	*Self-Assessment*	*External Evaluation*
	Average evaluation					*Above average*		

6.1.3 Prescription for forestalling failure into access gestation environment (prescription three)

The prescription consists of the explanation on the gestation problem of failure of access to the gestation environment (which is essential for validation by the end user), the principle of entrepreneurial bricolage, case examples and the gestation tool, referred to as Table of Resource Configuration (TRC) (see Table 19). The purpose of this prescription is to enable the gestation venture to analyze the ability to access and configure key resources in the internal and external environment so as to gain access into the gestation environment needed for validation by end of the twelve months. TRC is developed as an analytical tool to describe key resources, the origin of the resource, a description, reliance on network and uniqueness to the venture.

The study referred to the process model bricolage framework by Baker and Nelson's (2005) and resource valuation model by Barney (2001) to construct the "Table of resource configuration (TRC).

Firstly, adapting from the bricolage elements proposed by Baker and Nelson (2005), first level of hierarchy coding include the components: (i) original resource, (ii) reconfiguration process, (iii) reconfigured resource. For the first level of coding, "purpose", "sources" and "types of intermediaries are to be captured in order to understand the process of bricolage effects. The elements of "source" and "types of intermediaries" explained the accessibility from either internal or external environment as indication of network reliance inclination.

For the performance measurement, the resource valuation framework by Barney (2001) has been adapted in this construct. Under the concept, resource is classified to be valuable (V), inimitable (I), rare (R) and non-replaceable (N). The function of the classification is to distinguish between competitive and non-competitive resources as accessed by the market, which include end user in the gestation environment.

Thus, the ability to access and reconfigure the highly valuated resource bundle from internal and external environment would reflect a capability that would enable the gestation venture to gain access into the gestation environment for the necessary validation.

Table 19: Table of Resource Configuration (TRC)

Criteria	Answer (Description)
Statement on ability to create resource configuration for access into gestation environment for prototype validation by end user Please describe key resources, the resource origin, purpose, reliance on network	

S/No	Original resource (OR)	Reconfiguration			Reconfigured resource (RR)	Value of Resource	
		Purpose	Source	Intermediaries		Outcome	Valuation of RR
1							
2							
3							

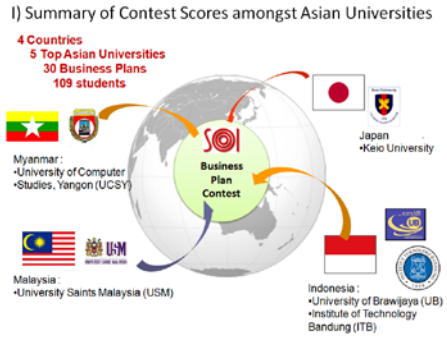
6.2 Prescriptions integrated into university-based entrepreneurship activities

The prescriptions of the University–based Venture Gestation Program (UVGP) are designed to benefit gestation venture student teams with the support of partnering universities in the Asia region. The prescriptions are embedded into existing entrepreneurship activities, such as online business plan workshops, business plan contests and onsite incubation (see Table 20 and Figure 5, 6 and 7).

Table 20: Integration of prescriptions into university based entrepreneurship activities

(i) Online educational workshops	(ii) Online business plan contests	(iii) Onsite incubation	(iv) Periodic review of gestation development
• Introducing venture gestation • Explaining three gestation problems (using case studies) • Introducing dynamic capability theory • Explaining three gestation tools • Applying gestation tools to develop gestation plan (participants)	• Providing presentation and assessment opportunity for gestation plan to panel of judges • Presenting gestation plan using narratives, and gestation tools (participants) • Providing evaluation of feasibility and attractiveness of gestation plan	• Reviewing and reconstructing gestation plan (facilitating detection of problems and formulating responses using gestation tools and case study references)	• Facilitating the review and reconstruction of gestation development (using gestation tools)

Fig 5 : Highlights of educational workshop

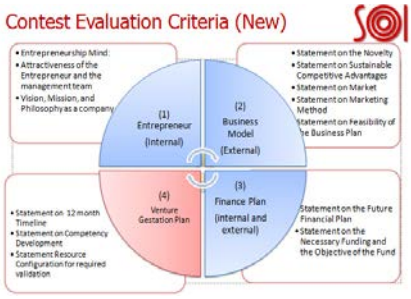


Participant in SOI Asia Business Plan workshop and Contest (Oct-Dec 2014)

University based satellite connected Business Plan Workshop (Nov 2014)

Fig 6: Highlights of SOI Asia Business Plan Contest

SOI Asia Business Plan Final Presentation (Dec 2014)



Configuration of Venture Gestation as part of new judging criteria for contest (Dec 2014)

Fig 7: Highlights of the onsite incubation program

Presentation of prototype development for venture gestation to panel of academic from electrical department as internal resource (Feb 2015)

Presentation on venture gestation from business perspective to incubation manager as internal resource (Feb 2015)

CHAPTER 7: EVALUATION OF THE SOLUTION

With the development of the designed solution to help student-venture gestation forestall the 3 problems, the study proceed to evaluate the effects of UVGP on the experimented gestation venture, as the final step in design science methodology. The purpose of the evaluation phase is to testify if the prescription helps to increase awareness of the 3 gestation principles and the dynamic capability of the team and forestall the 3 gestation problems.

A semi quasi experiment was conducted on 29 teams formed by 105 students from SOI Asia University Network, who participated in the School on Internet (SOI) Asia Business Plan Contest in 2014. Within which, the study tracked the gestation activities of the few top finalist teams, who were selected by neutral panel of judges.

Coincidentally, the 2014 champion, from the same university as the 2012 and 2013 champions, proved to be an ideally controlled subject for this research. For the evaluation, the champion team, name gestation venture E, was observed and interview for 12 months from January till December 2015, in order to evaluate the effectiveness of the intervention in overcoming the three gestation problems discussed above. The evaluation phase is to draw implication and make improvement to the program as an "emergent" solution

7.1 Experimental case study: gestation venture E

7.1.1 Background of gestation venture E

Gestation venture E was formed by 5 undergraduate students from the Faculties of Medicine, Informatics, and Electrical Engineering in University of Brawijaya (refer to Table

21). Based on UGVP principles, solution intervention was applied to gestation venture E to help achieve the goal of creating a hemorrhagic prevention device and training kit for testing and gain validation by the venture partner, the Indonesian Midwives Association, by end 2015, as per the listed chronological gestation activities (refer to Table 22).

Table 21: Background and gestation role of members of gestation venture E

S/ No	Name	Period	Duration	Academic level	Academic background	Role	Competency	Reason for leaving
1	Mr. F	Jan-Dec 15	12 mths	4th	Electrical	CEO	Management	Stay
2	Mr. R	Jan-Dec 15	12 mths	4th	Electrical	CTO	Development	Stay
3	Mr. A	Jan-Dec 15	12 mths	4th	Electrical	CTO	Design	Stay
4	Ms. T	Jan-Dec 15	12 mths	4th	Electrical	R&D	R&D	Stay
5	Ms. A	Jan-Dec 15	12 mths	4th	Business	Marketing	Fund raising	Stay

Table 22: Chronological gestation activities of gestation venture E

Schedule	Gestation Activities
Jan 2015	Won Champion of SOI Asia Business Plan Contest
Jan- April	Research for methodology of product
May –Oct	Development of prototype
July – Aug	Fund raising
Nov	Validation of prototype by Indonesian Midwives Association

7.1.2 Intervention on gestation venture E

In November 2014 the students of gestation venture E formed a team and joined an online business plan creation workshop through a university based satellite facility linking lectures from Japan and Indonesia and other parts of Asia. The students learned about the concept of venture gestation, the three gestation problems, the notion of dynamic capability theory and how the three design principles can point the route to venture success. They were taught to apply the three gestation tools to plan and create their

gestation proposal, as one part of the overall business plan. In December, as one of the chosen finalist teams, the students verbally presented their gestation plan to a panel of judges in the final presentation session of the business plan contest 2014/15.

After being evaluated as the 2014 winner with the best plan in the contest, the team received a three-day two-night intensive incubation from the contest organizer. For their review, the team was given the opportunity to use a gestation plan based on the three prescriptions. The team reviewed the potential gestation problems, applied the design principles, and revised their plan using the gestation tools as well as other diagrams. They presented their revised gestation plan in an updated version to all related stakeholders in their university, such as their product advisor, incubation manager, and even the members of the earlier gestation venture in the prescription case study, who happened to be from the same university. Thereafter, during every quarterly gestation feedback session, the team reviewed their action against their plan repeatedly using the principles and tools formalized in UGVP. Table 23 depicts the intervention conducted.

Table 23: Solution intervention on gestation venture E

Schedule	Activities	Solution intervention on the gestation venture
Nov 14	Online educational workshop	• Introducing venture gestation • Explaining three gestation problems (using case studies) • Introducing dynamic capability theory • Explaining three gestation tools • Applying gestation tools to develop gestation plan (participants)
Dec 14	Online business plan contest	• Providing presentation and assessment opportunity for gestation plan to panel of judges • Presenting gestation plan using narratives and gestation tools (participants) • Providing evaluation on feasibility and attractiveness of gestation plan
Jan 15	Onsite Incubation	• Reviewing and reconstructing gestation plan (facilitating detection of problems and formulating responses using gestation tools and case study references)

7.1.3 Outcome of gestation venture E

Based on the definition of gestation success in this study, the outcome by gestation venture E after 12 months has achieved success in it gestation by meeting both the tangible and intangible conditions (refer to Table 24).

In terms of tangible outcomes, gestation venture E, the team completed the development of a prototype with validation done by President of the Indonesian Midwives Association by end November 2015. Secondly, the gestation venture retained the term tenure of 5 members from founding team by the end of 12-month gestation. Next, the team managed to raise a sum of USD1000, which is more than the amount required for the development of the required prototype. The additional amount was utilized by the team for their fieldwork to Japan in December 2015.

For the intangible outcome, the remaining member in gestation venture E possessed the core competency to minimally replicate the same or create similar hemorrhagic prevention device. For their intangible track records they have received the award as champion for contest in Asia, 2014. In addition, the team created their educational case study as gestation venture and presented as guest speaker in Contest workshop 2015

Table 24: Measurement of success outcome for 12-month gestation E

Outcome	Indicators	Outcome	conditions
Tangible outcome	i. With a completed prototype within validation from end user as an acceptable outcome for consumption.	Developed the prototype of a hemorrhagic prevention device and received validation by President of the Indonesian Midwives Association by end November 2015	Achieved
	ii. With minimum of one or more original members from founding team students at the end of required gestation.	Total hiring of 5 members from founding team 5 members are from 1st generation (founding team)	Achieved
	iii. With minimum or above funding amount raised equivalent for the development of the required prototype (without other operating cost, eg salary or office space).	Successfully raised USD USD1000 for the development of prototype. On top of that the extra amount was used for fieldwork program in Japan	Achieved
Intangible outcome	iv. With competency to replicate same or similar product/prototype by remaining members	Members possess the core competency to minimally replicate the same or create similar hemorrhagic prevention device	Achieved
	v. With relevant track records relevant for gestation	Champion for contest in Asia, 2014 Create their educational case study as gestation venture and presented as guest speaker in Contest workshop 2015	Achieved

7.2 Forestalling of gestation problems with response based on solution intervention

The gestation venture E has successfully forestalled the three gestation problems at the end of 12-month gestation through solution intervention. The 3 problems include (a) the problem of instability of founding members, (b) competency inadequacy to create the minimum acceptable prototype of the creating a hemorrhagic prevention device and training kit, and (c) inaccessibility to receive validation by the venture partner, the Indonesian Midwives Association. The below are the descriptive development on the behavioral responses undertaken throughout the gestation by the team members after the solution intervention. Outcome is as shown in figure 8.

Figure 8: Gestation venture E: Preempting gestation problems and generating validated outcome at end of 12-month term

Started as a team and continued together until end of 12-month gestation (Nov 2015)

Gained sufficient competency to complete prototype by end of 12-month gestation (Nov 2015)

Earned validation of prototype from President of Indonesia Midwives Association at end of 12-month gestation (Nov 2015)

7.2.1 Stability of founding team during gestation through schedule adjustment (using prescription one)

Venture gestation E had achieved the gestation outcome of forestalling the instability of founding team by relying on prescription one and making necessary adjustments to fix individual member`s schedule as the response (See Table 25, Figure 9 and 10).

Firstly, gestation venture E undertook two parallel planning. One is the planning of key gestation activities and second is the planning of manpower allocation based on the termed tenure principle. The goal is to complete the gestation, and to forestall any possibility of exit of members in the founding team (See Table 25, Figure 9 and 10).

Through the prescription, the team divided their 12-month gestation into 5 main activities: business plan creation, methodology search, fund raising, prototype development and product validation for the gestation planning. There activities are conducted in sequential manner for the first 6 month, with simultaneous activities on the second half. Concurrently, in terms of securing termed tenure, the team adopted an autonomous and collaborative structure by dividing members into two sub groups, namely the R & D team and the marketing team, with 2 and 3 members respectively. The team specified both set of planning in TAM as an informal agreement and presented to their stakeholders at incubation program, and also their gestation commencement point. With the awareness of the problem of instability team that leads to gestation cessation and principle of term tenure through the entrepreneurship activities, the team verbally committed to accomplish the tasks based on their timeline on TAM.

Next, the team commenced their product design by trying to identify the right technology to be designed for the hemorrhagic prevention device. However the time lapse for completing the product methodology research and learning was about 4 months, longer than their initial plan. The R &D team was faced with the disruption of their termed tenure and deterrence to gestation due to their academic requirement to complete a 2-month company internship. As a means of overcoming the problem, the R & D team combined the internship activities and the gestation of prototype development as one. They identified and worked for a local small and medium enterprise than enable them to develop their prototype as part of the job training, and also be recognized as internship program. The adjustment enabled them to maintain the termed tenure and avoided any instability to the founding team to continue the gestation.

Simultaneously, with the requirement of funding for the materials and necessary administrative costs, the marketing team, made up of other 3 members started to solicit for external funding by reconfiguring their research plan, as per the plan in TAM. They received some funding from their own university by June and also convinced a group of medical doctors who acted as the financial angels to provide a total sum of USD 1000 by Oct.

For the last gestation activity, the 5 founding members in gestation venture E travelled from their university town, in Malang city to Jakarta to meet and presented their prototype for validation with President of Indonesian Midwives Association. It marks the completion of all gestation activities planned and adjusted based on TAM and also maintained their termed tenure.

Table 25: Table for Timeline Activity and Manpower Planning (TAM) of gestation venture E

Tenure Planning					Performance	
Schedule	Tenure duration	Gestation task	Tenure size	Team tenure stability	Strategy conformity	Gestation activity outcome
Nov-Dec 14	2 mths	Creation of business plan	All (5 pax)	Stable	Conformed	Completed. Received the contest champion award
Jan-May 15	5 mths	Identification of methodology	Product and R&D (3 pax)	Stable	Conformed	Completed Research on difference methodologies
Jun-Oct 15	5 mths	Fund raising	Marketing Team (2 pax)	Stable	Conformed	Completed. Raise a sum USD1000
Jun-Oct 15	2 mths	Prototype creation (incl.internship)	Product and R&D (3 pax)	Stable	Conformed	Completed
Nov 15	1 mth	Validation	All (5 pax)	Achieved	Conformed	Completed. Met and received validation President of Indonesian Midwives Association

Fig 9: Five founding members who won contest champion before gestation commencement (Jan 2015)

Fig 10: Five founding members remained in tenured after 12-month gestation activities (Dec 2015)

7.2.2 Increase in gestation competency through action to gain competency (using prescription two)

Venture gestation E had successfully forestalling the problem of competency inadequacy through taking action to gain the required competencies (See Table 26, and from Figure 11 to 14).

In terms of competency adequacy, none of the members had perceived themselves to have full competency in their respective tasks. Firstly, Mr F, the CEO had no experience in organizing the gestation venture, and does not have prior academic background, except for his personal interest, and practice in organizing team. For the research and development team, made up of Mr A, as the chief designer, Mr A, the assistance and Ms T, the supporting members were faced with issue of greater competency compatibility. Both Mr A and Mr T were from engineering background, however they only possessed academic skills and limited applied experience on the development of the device. Finally, for the funding raising task fell on the Ms A and the support of Mr F. Both have experienced in writing proposal. However, they have no experience on the venture fund-raising.

For the first gestation activity, gestation venture E started by identifying the methodology for the device. They received the mentoring and training by Mr. F, an Alunmi of UB to gain the competency on “sensor matrix” method for device. However due to the lacking of time by Mr F after two months, the team could only rely on co-learning between the team members, with the support from lecturer, Medical Department in their parent university. The team acquired the competency on standard operational procedure (SOP) for birth delivery for midwives. By May, they managed to receive mentoring, training and incubation space by Mr. M, CEO of local SME, also Alumni of UB. They were able to gain competency on creating the device using the “Image processing method”, as an alternative methodology.

Thereafter, in order to design and create of prototype, the R&D team was able to acquire new competency of designing the blood senior camera component for the device through their Internship with company D, in Malang City. Design of prototype and overall configuration.

Furthermore, for acquiring the competency for infra-red sensor methodology, the team had undergone apprenticeship with Mr. P, the Senior Physics Instrumental Researcher in Gajah Mada University. Finally, the team gained the necessary competency to compete the full validated prototype of the hemorrhagic prevention device prevention device and presented it to their targeted customer, would receive validation and feedback by President of Indonesian Midwives Association.

Table 26: Table for Competency Compatibility (TCC) by gestation venture E

Time	Gestation stage	Acquisition of required competency gain (new)	Learning methodology (new)	Source (new)	Outcome
Jan-Mar 15	Methodology search	Competency on "sensor matrix" method for device	Mentoring and training by Mr. F, an Alunmi of UB	External	10%
Jan-Mar 15	Methodology search	Competency on standard operational procedure (SOP) for birth delivery for midwives	Co-Learning for team members Academic learning from lecturer, Medical Department, UB	Internal	10%
May-July 15	Methodology and prototype creation	Competency on creating "Image processing method"	Mentoring, training and incubation space by Mr. M, CEO of local SME, also Alumni of UB	External	20%
Aug 15	Design and creation of prototype	Learning about blood senor camera. Creation of prototype (free raw materials)	Internship with company D, in Malang City	External	30%
Aug-Oct 15	Design, testing of prototype	Design of prototype and overall configuration Learn about infra-red sensor methodology	Instruction from Mr. P, the Senior Physics Instrumental Researcher, Gajah Mada Univ.	External	40%
Oct 15	Academic validation	Improvement of design and functionality of prototype	Validation and feeback 1) Mr. P, Gajah Mada University (external university) 2) Ms. R, immediate advisor, UB	Internal and external	80%
Nov 15	Industrial validation	Improvement of design and functionality of prototype	Validation and feedback by President of Indonesian Midwives Association	External	100%

Fig 11: Mentoring and training by Mr. F, an Alumni of UB

Fig 12: Instruction from Mr. P, the senior physics instrumental researcher

Fig 13: Graphics of hemorrhagic prevention device before Gestation (Jan 2015)

Fig 14: Completion of prototype of hemorrhagic prevention device after 12-month gestation (Dec 2015)

7.2.3 Accessibility to end user for validation through resource reconfiguration (using prescription three)

Venture gestation E had forestall the problem of inaccessibility into their require environment for validation by reconfiguring their key resources (See Table 27, and Figure 15 to 16).

Firstly, gestation venture E utilized the unique business plan of creating a hemorrhagic prevention device, which they received the champion awards from Asian wide business plan contest, and reconfigure it into two new resources, namely a research and development plan and funding research proposal. For the research and development plan, they had received about USD300 for their parent university to buy parts of the raw material. The funding research fund was pitched to a group of medical practitioners in Jakarta, referred by the parents of one of the team members. The funding angel were persuaded by the team`s potential and the significant impact of the device to provide the exceptional funding support. The outcome explained the “inimitable” valuation of the two new resources which arises based on the entrepreneurial bricolage behavior undertaken by the team.

In addition, the gestation venture E relied on institutional network to gain the competency needed for the creation of the prototype. Through the University alumni network recommended by their immediate academic advisor, Mr M, who was one of university alumni and also an entrepreneur, provided the team with free space incubation for initial 3 months and free consultation on product design. Furthermore, venture gestation E was able to leverage on inter-university network, also recommended by another academic advisor to seek apprenticeship with Mr. P, the Senior Physics Instrumental Researcher in Gajah Mada University, which is the oldest state university renowned for technological expertise. Through the apprenticeship on the design and validation of the prototype by Mr P, the final prototype was deem completed and ready for presentation to their end user, Indonesian Midwives Association, Indonesia.

Table 27: Table of Resource Configuration (TRC) by gestation venture E

S/No	Original resource (OR)	Reconfiguration			Reconfigured resource (RR)	Value of Resource	
		Purpose	Source	Intermediaries		Outcome	Valuation of RR
1	Contest business plan	To raise fund	Internal	University	R&D Plan	USD300	Inimitable
2	Contest Business Plan	To raise fund	External	Group of medical practitioners from Jakarta, Indonesia	Fund raising proposal	USD700	Inimitable
3	University Alumni Network	To acquire Mentoring, training and incubation space	Internal	Mr. M, CEO of local SME, also Alumni of UB	Mentoring, training and incubation space	Gained skills and resource for prototype	Valuable
4	Academic Network	To acquire new competencies and validation by academic	External	Mr.P, Gaja Mada University	Apprenticeship program	Gained skills and validation for prototpye	Valuable

Fig 15:Team received comments by Ms E., President of Indonesia Midwives Association before gestation (Dec 2014)

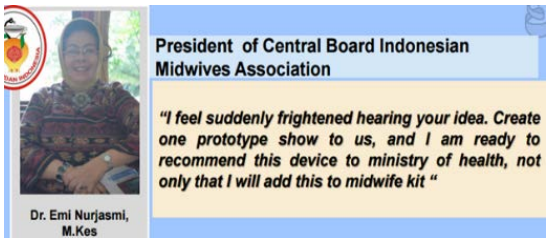


Fig 16: Validation and offer opportunity for presentation in institution by Ms E., President of Indonesia Midwives Association after gestation (Dec 2015)

7.3 Evaluation on Design Solution

The review of solution with members of gestation venture E shows that the program has been effective in raising the awareness of the three gestation problems, the three principles of the venture gestation model in UVGP, the three gestation tools to make planning to forestall the three anticipated problem at the commencement point, rather than awaiting for the problems to arise in the process of gestation process.

7.3.1 Increase in awareness of team instability, termed tenure, and effectiveness of tools (for prescription one)

Through the solution intervention of prescription one, gestation venture E gained awareness of the problem of instability of founding team member and termed tenure principle. The result was a continuous 12-month collaboration among the same team members, with no incidents of early exit, and accomplishing their task as per plan (see Figure15 and 16).

At the evaluation, the team highlighted the effectiveness of the case study with failed outcome (gestation venture K) which has taught gestation venture E members to forestall

the departure of team members. They were especially mindful not to allow any exit of members within the 12-month timeframe. The case studies in the prescription contrasted the downsides of this point vividly. However, while team members evaluated the concept of term tenure to be somewhat helpful they found it “too theoretical” and demanded further explanation.

Mr. FA, CEO of gestation venture E, commented, "Through the case studies in the online workshop, we learn how the exit of founding members negatively affects the gestation success. These cases are a good reminder for us of the problems and principles that go with it.”

Secondly, gestation venture E commented on the effectiveness and practicality of the Table for Timeline Activity and Manpower Planning (TAM). The applied the gestation tool by adjusting their manpower schedule, roles and duties in accordance with gestation activities while also allowing for changes in conditions. The members said that the tool was not a static tool, but a flexible planning aid that allowed both individuals and the team, to achieve a balance of gestation tasks suitably matched to their own academic studies. They reallocated gestation time frames based on actual efficiency of task completion. For example, the team spent more gestation time on methodology search than expected in their initial plan. However, they compensated for it by combining its time allocation with that for the next gestation activity.

Mr. FA said, “TAM is a just a tool, but the principle involved is important. We can adjust our gestation timings, but we are still accountable to one another, as well as to our stakeholders”.

Using TAM, members of gestation venture E were also able to synchronize gestation activities with other academic activities and personal development. Two members managed to align the purpose and timing of a 2-month internship, which is part of their academic requirements, with the gestation activity on prototype creation. That planning

flexibility prevented the exit of members, which could have resulted in gestation cessation as in fact had happed in the failed case study.

Quoting Mr. RO, the product development member of gestation venture E, “I knew that I had to find support to acquire more know-how for creating and testing the prototype. I also knew that I needed to fulfill my academic internship. So, in order to meet our gestation goals and manage my graduation, our product design team decided to look for internship companies that allow us to achieve both. And we did it as a team and got things done on time!”

7.3.2 Increase in awareness of competency inadequacy, competency compatibility, and “warning effects” of tools (for prescription two)

Based on the second prescription of UVGP, gestation venture E had gained awareness of competency inadequacy problem and competency compatibility principle. They overcame the problem of competency inadequacy during prototype design, development and testing, and successfully completed the fully designed prototype by the end of the 12-month gestation. The evaluation reflected the weakness of the Task and Competency Compatibility (TCC) tool as a suitable methodology for effective competency development in gestation ventures.

The first effect of prescription two is the increase in awareness of the problem of competency inadequacy amongst existing members and the necessity to achieve competency compatibility in throughout the gestation process. In this sense, the prescription was effective as an “early warning” and they considered the principle of competency compatibility useful. That prompted the team to plan for their competency developmental program.

Next, the second effect through the prescription two and application of “Table for Competency Compatibility” (TCC), the pre-post individual competency evaluation reflected increase in competencies amongst members of gestation venture E.

Firstly, an individual competency evaluation for accomplishing gestation tasks was measured by individual members based on their existing competencies. The exercise reflected an average of 31% competency compatibility level, which is based on competencies gain through studies and their limited extra-curriculum activities accumulated through their academic life

A post gestation competency evaluation was conducted at two levels: include the self-evaluation, as well as evaluation of gestation output by external agent. In terms of post gestation self-evaluation, the average of the competency evaluation was assessed to be 75%. Of which, the research and development team were able to increase their competency largely relying on the external sources to acquire competency beyond their parent university and team co-learning due to the difficulty of the technology.

In addition, based on the output of each gestation phase, the team received indirect evaluation from their immediate stakeholders, include SOI Asia Business Platform; Mr. P, the Senior Physics Instrumental Researcher, Gajah Mada University and the funding Angels. The stakeholders rated the 3 outputs; (i) manage and keep the team going on by CEO, (ii) completed prototype development by research and development team, and (iii) funding Proposal by fund raising team as “above average”, on the basis of the evidence of student’s consistency and quality of output after 12-month gestation.

The post gestation evaluation by team reiterated the usefulness of TCC as a gestation tool in informing team members about their competency gap as against the requirements of the tasks. The tool highlighted the competency gap of members and triggered an urgent search for competency development alternatives beyond the university environment.

Mr. RO, the product development member of gestation venture E, commented, "It was during our presentation on competency compatibility that we considered various methodological options for product development. We discovered that there was a real competency gap with regard to our chosen methodology. So we became motivated to find ways to learn and overcome these difficulties."

Table 28: Table of pre-post individual competency evaluation of gestation venture E

S/No	*Name*	*Role*	*Task*	*Self Competency evaluation (before gestation)*	*Self competency evaluation (after gestation)*	*Competency valuation by external stakeholder (After gestation)*	*Self-Assessment (After gestation)*	*External Evaluation (After gestation)*
1	Mr F	CEO	Manage and keep the team going	35%	75%	Above average	Manage and keep the team going	SOI Asia
2	Mr R	CTO	Lead for the prototype development	30%	75%	Above average for 12-months but need continuous research	Completed Prototype	Mr. P, the Senior Physics Instrumental Researcher, Gajah Mada Univ
3	Mr A	CTO	Assist on the prototype development Design	20%	75%		Completed Prototype	
4	Ms T	R&D	Co-developed prototype and liaison with Midwives Association	35%	75%		Co-developed prototype and Constant liaison with Midwives Association	
5	Ms A	Marketing	Prepare Funding raising and marketing	35%	75%	Above average	Funding Proposal	Funding Angel
	Average evaluation			*31%*	*75%*	*Above average*		

7.3.3 Increase in awareness of inaccessibility into gestation environment, entrepreneurial bricolage, and effectiveness of tools (for prescription three)

Gestation venture E overcame the problem of failure of access to the gestation environment and successfully interviewed the President of Indonesian Midwives Association to get validation for future opportunity by the end of 12-month gestation (see table 19).

Applying the principle of entrepreneurial bricolage and the “Table of Resource Reconfiguration” (TRC), the team reconfigured and bundle their key resources as means of getting access and the end users. The gestation venture gain the total funding of USD1000 dollars, raw material, and key competencies for the research and development of the device prototype by reconfiguring their resources within the internal and external environment.

For the post evaluation, the members reiterated the relevant of principle of entrepreneurial bricolage as the theory reversed their perception that, by default, students do not possess resources and therefore would not be able to complete gestation.

Mr. FA, CEO of gestation venture E, commented, "I used to think that we do not have resources and that they were just a big dream that never comes true, the way students usually think. However, now I know we can reconfigure whatever we have (original business plan) and our resume (track record) to meet Ms. E, the President of Indonesian Midwives Association with confidence. Given her evaluation and feedback, I am ready to improve the prototype and have it ready for her institution in 2016.”

Next, the team highlighted that the usefulness of Table of Resource Configuration (TRC) was not clear at the gestation commencement point, but becomes evidently useful when all gestation activities were completed and increase the level of persuasion to their end user on their bricolage behavior. The team used the TRC as a reference table to explain

their 12-month resource configuration when presenting it to Ms. E, the President of Indonesia Midwives Association. They received favorable comments and the opportunity for gestation continuity.

Ms. E, President of Indonesia Midwives Association, said "Their prototype is good, but still not adequate for current clinical usage. However, I am impressed that they are entrepreneurial enough to gather their own funding. They have a good track record as champion in the Business Plan Contest in Asia and they have completed a gestational prototype that will solve a medical problem far beyond this group of undergraduate students. That is why I am happy to open the door for them to see me again and conduct a demonstration class in our institution with their revised prototype. I wish my institution can be an experimental bed for them, too".

7.4 Recommendations for solution improvement

Apart from the above two effects of solution intervention, the evaluation also provides two important sources for improvement to the program (i) Competency Development Plan and (ii) listing of essential traits and competency of CEO in the founding team of a gestation venture.

7.4.1 Competency development for members in gestation venture

The first recommendation is to further enhance the Table for Competency Compatibility (TCC) to include competency development options to ensure that on par competency acquisition with the required gestation activities.

Clearly, TCC as a gestation tools only highlights the competency gaps and indicate possible competencies that may be required for the gestation activities. With the competency development plans will trigger the consideration on sources of learning, duration of learning and accreditation of learning may create motivation and options for members to compare and select the means that would be most appropriate for their time and effort.

Figure 29: Suggested Table for Competency Development Plan of Gestation Venture

S/No	Gestation stage	Required competency	Source of Learning (organization)	Duration (eg weeks/ month)	Accreditation (eg certificate)
1					
2					
3					
4					

7.4.2 Essential traits and behavior of CEO for gestation venture

Through the evaluation, the traits and behavior of CEO within founding team is deemed to most crucial, especially in the first 12-month of gestation. The “right” traits and behavior of CEO within founding team of a gestation venture affects the decision making that will lead to different action of the team members during the gestation success. Through the interview and reference on literature review, a list of essential traits and behavior of a CEO in gestation venture are proposed in this study.

Firstly, in terms of personality traits, three characteristics are identified to be essential: such as need for achievement, creativity, risk taking and locus of control, which were observed in the actions of the CEO throughout the gestation. For example Mr F, the CEO projected the need of achieving in his expression of wanting to achieve the gestation goal as set by the team. Secondly, his creativity was shown in brainstorming and planning of resources. Next, he undertook the risk to commit to the prototyping making even when the team started with no financial support. In terms of locus of control, it can be observed

as he made decision to chart the gestation to ensure all the activities are aligned with the gestational goals.

Using the behavioral approach, self-efficacy of CEO explained how Mr F has successfully mobilize the motivation, cognitive resources and course of actions to control events. Trust as a behavioral expression of empowerment for members through to making decision on key task during gestation. In sum, the present entrepreneurial traits and entrepreneurial competencies of CEO in any form gestation venture would be important.

The listing of essentials traits and behavior of CEO in founding team of a gestation venture is provided in Table 30.

Table 30: Six essentials traits and behavior of CEO in founding team of a gestation venture

S/No	Competency	Definition
1	Need for Achievement	Refers to the desire to lead, shape and complete projects (Caird, 1991)
2	Risk Taking	Refers to being opportunistic and seeks information and expertise to evaluate if it is worth pursuing the opportunity (Caird, 1991)
3	Creativity	Refers to ability to develop ideas to create new products and processes (Caird, 1991)
4	Locus of Control	Refers to the desire to seek to exert control over life, draw on inner resources through their own efforts and hard work (Caird, 1991)
5	Trust	Refers to empowerment of decision marking and key duties to team members (Liao & Welsch, 2005; Zahra et al., 2006))
6	Self-efficacy	Refers to perception of ability to organize resources (Wood & Bandura, 1989)

CHAPTER 8: CONCLUSION

There is an increasing attention being devoted on research on university-based venture (including students) since development of “Silicon Valley and “Route 128” (Cooper 1971; Roberts, 1991). “Student” formed venture has been studied as a subset of university-based venture. However, there are few literatures which have conducted empirical studies on the gestation process of student based ventures.

This paper presented the research question of how to create gestation success for student-based gestation venture in university by using design science methodology. The objective is to determine what would be needed for designing a program within the university that would result in gestation success for ventures initiated by university students.

The firstly step is to derived design inputs from identifying key problems and reactions by two student-based gestation ventures, in which one has achieved success in gestation, while the one has failed. The three problems are instability of founding team, inadequacy competency by team, and the inability to access into gestation environment necessary for validation by end users. Secondly, in order to obtain further design inputs, the study refer to theories that are related to the three gestation problems to derive three design principles, termed tenure, competence compatibility and entrepreneurial bricolage. Drawing on the dynamic capability theory, the three principles were adapted to derive Venture Gestation Model (VGM).

Thirdly, using the design inputs and survey from informants of the entrepreneurship system in university, the study developed a design solution, a University Based Venture Gestation Program, with three prescriptions embedded within existing university entrepreneurship system to help student-based gestation venture increase the chance of

achieving gestation success. In the fourth and final step, the study conducted evaluation of the program through intervention and observation on gestation effects of a new gestation venture for a 12-month duration. The evaluation and feedback are used for improvement on the program.

8.1 Implications

There are several important implications derived through the completion of University-based Venture Gestation Program (UVGP) and the outcome of the observed student-based gestation ventures that enable the improvement be made on future implementation.

Firstly, the project evaluation found that, drawing on the tenets of dynamic capacity theory, team members started off with the advantage of more detailed knowledge of gestation problems, the principles of term tenure, competency compatibility and entrepreneurial bricolage, which are important for forestalling gestation problems in changing environment by the gestation ventures.

Secondly, evaluation of the prescriptions by the gestation venture provides positive implication of the three design prescriptive tools. The results shows the relevance and applicability of two gestation tools, namely (i) Table for Time Activity and Manpower Planning (TAM) and (ii) Table of Resource Configuration (TRC) to enable gestation venture to forestall and resolve gestation problems. The team utilized Table for Time Activity and Manpower Planning (TAM) tool for planning and execution of task allocation. They completed their gestation through ensuring the stability of the founding team throughout 12- month gestation. In addition, through the Table of Resource Configuration (TRC) tool, the gestation venture demonstrated their ability to reconfigure and explain how they create and exploit the valuable resources from internal and external environment, in order to lead to lead toward validation of completed prototype with

prospective opportunity from President of Indonesia Midwives Association after their 12-month gestation.

On the other hand, the evaluation shows Table of Task and Competency Compatibility (TCC) tool to be effective in reflecting competency gap between the required task and the competencies of incumbent members, but inadequate as a prescription to forestall the issue of competency development faced by the gestation venture. On that note, future improvement of TCC is necessary to track and incorporate alterative learning sources, through internal and external environment, and the incremental competency level as suggested functional of TCC as gestation tool. With this data in hand, competency inadequacy and compatibility within the team could be achieved.

Through the evaluation, there are two recommendations. Firstly, the enhancement of Table of Competency Compatibility (TCC) tool to include Competency Development Plan to help address the need for competency development options. Secondly, the checklist of traits and competency of CEO in founding team of gestation venture would be useful to better select the or even prepare the candidate for his leadership and management in gestation.

As an overall evaluation, University-based Venture Gestation Program (UVGP) has proven to be a necessary and effective designed solution to help the student-based gestation venture to increase awareness of gestation problem and minimally forestall the 3 gestation problems within the anticipated environment change conditions.

8.2 Limitations and future research

There are limitations encountered during the gestation and recommendation made on overcoming them for future research.

Both the VGM, which was derived from two gestational ventures, and the evaluation of UGVP as applied to a single case, have limits in their external validity of the designed solution. We maintain, however, that this approach, which identifies controlled samples from a large number of student teams with varying maturity and competence, has been the most effective in exploring this under-studied area. Thus, the recommendation for the next phase of research is consider how to include more cases for evaluation in order to increase the external validity of the program effectiveness.

Secondly, in terms of the effectiveness of the UVGP as the design solution, the effectiveness of program is narrowed and restricted only to forestall the three key gestation problems, namely (i) forestalling of instability of founding team, (ii) forestalling of competency inadequacy, and (iii) forestalling inability to access into the required gestation environment. The program addressed only a subset out of a diverse range of issues related to gestation success. Nevertheless, the study provided new insights to the understudied issues with prescription that undertake to minimize the anticipated problem through awareness of principle and application of tools. Thus, for subsequent research, more case should be added to experiment to uncover other imperative issues relevant to gestation studies.

Next, the third limitation is the issue of research bias. As the researcher himself was also involved in supporting the three gestation ventures, which observing the case with a research lens. However, the issue has been controlled and minimized as validation has been done throughout the design of program, with the feedback of the informants, and evaluation of the gestation ventures have been conducted with feedback and counter checks from the second contributing author.

Fourthly, the limitation lies in time constraint and research resource to implement the full program. Each implementation of the full program lasted about 3 months, with a feasible observable duration of 12 months for the full effects of the gestation, in order to observe

and explain the outcome of the intervention. The implementation of workshop, contest and incubation was only single-handed by the researcher with support of the program informants from academic, incubation manager to industrial practitioner amongst universities in SOI Asia University Network. Given the constraint of time and resource required to develop and test the program, the research would not have been possible if without the resources and support from the uniqueness of SOI Asia university network.

Last by not the least is the lacking in the challenge in the typology of dynamic capability applied in venture gestation as discussed in this paper. The debate of dynamic capability as an organizational ability to “predict and response” or the ability to “react and response” only when encounter problem. However, in this study, the definition of dynamic capability as the organizational ability to access and reconfigure competency and resources to overcome gestation problems in change environment is silent and did not address the issue future. Thus, the recommendation of the future research is to consider difference in timing of awareness and response time that may reflect the difference in organizational ability to forestall the gestation problems.

8.3 Research contribution

This study has provided contribution in three specific areas, such as academic, methodological and industrial contribution.

In terms of methodological contribution, the study is regarded as yet another empirical exercise in confirming the importance and readiness of design science methodology to be introduced and applied in developing theories and creating solutions in entrepreneurial inquiries. It helps to widen entrepreneurship scholar to go beyond just basic or applied science method, in order to advance entrepreneurship discipline through empirical results with prescriptive outcome.

Next, the study also provides an academic contribution in substantiating the important of dynamic capability theory in explaining the phenomenon of gestation ventures, particularly as initiated by university students. In this study, dynamic capability is explained to be a capability that is necessary for gestation ventures to react to the three gestational problems that arise due to environmental changes. In addition, the study has also expanded the definition and justify the application of entrepreneurial bricolage theory, as one of the induced principle in the venture gestation model. The theoretical contribution is important in expanding the entrepreneurship field, which is young and still lacking in empirical evidences.

Furthermore, the study has provided industrial contribution towards entrepreneurship education by means of developing the University Based Venture Gestation Program. The program and the essential prescriptions are new in content and pedagogy as compared to the existing entrepreneurship curriculum and classroom oriented teaching in university. The program has been piloted as design solution through this study. With the evaluation and feedback the version two of the program has been implemented in since November 2015 and till 2016 amongst the SOI Asia Universities. The eventual goal is to ensure the scalability of the program to support from gestation ventures across more universities, while drawing on the cases, whether success or fail, as materials for entrepreneurship education, originally and uniquely created for Asian Universities.

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Appendix I

Interview on gestation problem and response with

Mr A, CEO of gestation venture N (10 Jan 2015)

Part I: Questions about gestation background

Q1) What is your goal of your business plan?

A1) Our team proposed to create an integrated medical information system to improve efficiency in processing of medical records within a single medical institution, and a long term plan to integrate medical records electronically through share database amongst medical institutions in Malang city, Indonesia.

Q2) Who are the members in your team?

A2) We are a group of five students from University of Brawijaya (UB), Indonesia in January 2013. The five-member team was a combination of third year undergraduate students from various faculties, such as medical, information system, mechanical and business department, within Brawijaya University.

Q3) How did your team start the venture gestation?

A3) We formed as a team to create business plan contest for SOI Asia Business Plan Contest in 2013. We have also narrowed the scope of the design on the development of information system for "Outpatient Medical Consultation Service Process", which include the process of outpatient's registration, medical consultation, and medical collection till payment.

Part II: Question about gestation problem

Q4) What are some of the major problems encounter during gestation?

A4) Our team began to encounter challenges that threatened the continuity of the venture gestation process. Firstly, within the five-member entrepreneurial team, four members had diverted their commitment and priority towards their individual academic and career development; and drifted away from the venture gestation activity. Mr B was selected to join an internship in Japan, while Ms I began to be busy with her medical internship, as well as marriage plan. Mr E's competency in mechanical engineering on the design of hardware sensor for the information system was not an immediate required task for the next gestation phase, while Mr Q, who was the financial officer, had no related financial tasks at the early stage of venture gestation. Eventually, I am the only person left in the gestation venture to continue the research and development activity for gestation.

The second problem that we faced was the lacking of essential competencies needed for the creation of the medical information system. As mentioned, I am the only remaining member in the venture at the mid gestation stage, possessed only basic skill for programming at the undergraduate level. However, the medical information required a higher level of knowledge and skills in order to design and construct a ready-for-market medical information system which is beyond my capability to cope.

Lastly, we encountered the problem of accessing into an existing medical institution for the research and development as the next gestation phase. In their original proposal, we had targeted at Brawijaya University hospital, as the affiliated institution with the university, as well as Saifu Anwar Hospital, a public hospital in Malang City. However, we could not get access into the hospitals with

their proposal. Thus, that is a real problem for us at the stage of research and the product development.

Part III: Response to the gestation problems

Q5) How to do you overcome the problem of instability of founding team?

A) I am glad our gestation venture recruited the 3 new members who stayed throughout the period of completing the process from design to validation of the medical information system". It explained the importance of the presence of the new members, which led to the completion of gestation activity. If I have only relied on the first generation of members, I wouldn't have gone this far. With the completion of the medical information system in Brawijaya University Polyclinic, we are one step towards our goal towards creating the venture eventually.

Q6) How to do overcome the problem of inadequate competencies of existing members?

A) We do not possess all the competencies for job at the beginning. The new members have good knowledge from school but lack practical experience. However, as team, it is new for us to create information system for a real medical institution. But we have learnt from one another, and from the medical environment, especially the ideas from the end users, like the doctors and administrators. Finally, we can finish the job as a pilot with good feedback.

Q7) How do you overcome the problem of inability to access into the medical environment, in order to conduct your validation?

A) Our business plan was to create the medical information system required by the medical institution. To do that, we needed the environment by an authorized

medical institution, in order to access into the existing operation and procedures to learn about the “Outpatient medical consultation service process”. In addition, we required a sum of funding for the purchase of minimum software and hardware for the development of the information system. We were able to seize the opportunity of research plan competition to gain from the monetary award that was need for the research and development of the prototype of the medical information system. We could bundle and reconfigure the venture-own resources into a strong proposition in order to convince Brawijaya University Polytechnic. We reconfigured our champion business plan into a research and development plan in order to gain the research funding of USD800 dollars. Next, we acquired the letter of recommendation from the university rector, who was convincing based on their champion records in business plan contest. In summary, we customized our research plan for Brawijaya University Polyclinic, the earlier track winning records and the available research funding were included, in order to prove our readiness and attractiveness. Thus, we were successful in signing memorandum of agreement the Brawijaya University Polyclinic.

Q8) What happen to your venture gestation at the end?

A8) With the success in gestation, we registered as an legal entity by end 2014. I must say that we through the venture gestation process, we have gained a sum of USD 800 funding, attracted a total of six members at the point of establishment, mostly working on a part-time basis. Our venture has the ready core competency to undertake any business in development of medical information system. We also have ready prototype that can be customized for sales.

Appendix II

Interview on gestation problem and response with

Mr F, CEO of gestation venture K (15 Jun 2015)

Part I: Question about the gestation background

Q1) What is your goal of your business plan?

A1) In the business plan, we proposed to create a Diabetes Therapeutic Medical Device that could heal bacteria infected wound and prevent amputation on patients as innovation in the medical engineering field.

Q2) Who are the members in your team?

A2) Our group was formed by five undergraduate students from University of Brawijaya (UB). Within the five–member management team, four of our members were from Faulty of Electrical engineering and one member from Faculty of Economics from University of Brawijaya.

Q3) How did you start the venture gestation?

A3) We joined the SOI Asia Business Plan Contest in 2014. We are lucky that our business plan was selected as the champion team out of fifty business plans competing from other cutting edge universities in Asian. Subsequently, we decide to continue our gestation goals on the research and design of antenna and oscillator, which are pertinent components for the medical device.

Part II: Question about gestation problem

Q4) What are some of the major problems encounter during gestation?

A4) Our team has encountered three major problems amidst the gestation process. The first problem was the lack of competencies among members in effectively designing the antenna and oscillator for the needed device. During the initial six months of gestation, the gestation venture consulted Japanese experts for product development and packaging design. Our members became aware of their limitations in wireless methodology and were unable to succeed with the design of the medical apparatus. According to the Japanese product expert, we would have required one or two years to master the skill needed to fully create a prototype based on the chosen methodology. Thus, we access that we do not possess adequate capacity to advance the gestation activity.

The next problem encountered was the unforeseen exit of our founding team members. Our original team of five had shrunk to two by August 2014. Three of team members had to leave the gestation venture as they had accepted permanent job offers at some large Indonesian corporations. The remaining members were Mr. D, the finance officer and myself. Mr D was not active after that. In the end none of us were proficient to continue the gestation activity in view of inadequate competence and manpower.

The third problem that our gestation venture encountered was a limited environment for research and development, which made it difficult to fully produce a minimum prototype of the envisaged device. None of us nor our university possessed the instruments necessary to conduct design and testing based on their methodology. Moreover, we could not get direct access to the medical environment needed for research and development of medical equipment.

Part III: Response to the gestation problems

Q5) How to do you overcome the problem of instability of founding team

A5) The idea of the business plan comes from our original team members. It is too bad that they are gone. I personally value the important of building trust and team work, however it is difficult for me to find anyone within such short time that can satisfy the conditions. So I just decide to continue the project on my own.

Q6) How to do overcome the problem of inadequate competencies of existing members?

A6) Frankly, I am not really familiar with the full technology requirement to complete the device. The task requires more skills and competencies. I admitted that I am more inclined toward management than handling the technical requirement. I just do whatever I

Q7）How do to you overcome the problem of inability to access into the medical environment, in order to conduct your validation?

K) We did not have formalize any assess rights that could complete their desired gestation goal. We only manage to conduct a few informal visitations and discussion sessions with academic staff and students from medical faculty in University of Brawijaya University. However, they did not develop any formal collaboration with the medical faculty. The discussions were rather informal. It did not really help in the prototype making.

Q8) What happen to your venture gestation at the end?

A8) I tried to continue the prototype development. I only managed to improve some parts of the prototype before handing it over to the electrical faculty in my university. By March 2014, I decide to end the venture gestation as I need the time to focus on my graduation.

Appendix III

Evaluation of designed solution with

members of venture gestation E (on 1 Dec 2015)

Part I: Question about the gestation background

Q1) What is your goal of your business plan?

A1) In the business plan, we proposed to create a hemorrhagic prevention device and training kit to help early detection of hemorrhagic accidents faced in medical field.

Q2) Who are the members in your team?

A2) Our group is formed by five undergraduate students from University of Brawijaya (UB). Within the five–member management team, we are a diverse group from Faulty of Electrical engineering, Informatics, Medical department in University of Brawijaya.

Q3) How did you start the venture gestation?

A3) We joined the SOI Asia Business Plan Contest in 2014. We are selected as the champion team out of fifty business plans competing from other cutting edge universities in Asian. We decide to continue our research and development of our device. We fix the gestation goals to get validation of prototype from President of Indonesia Midwives Association by Dec 2015 as our goal after 12 months of gestation.

Part II: Evaluation on Intervention

Q1) Does the prescription 1 help to avoid the problem of instability of founding team?

A1a) Yes, the prescription has help us to forestall the possible problem of founding members leaving the team before the 12-month gestation. We learn from the case study with failed outcome about the problem of instability of founding members due to departure of team members. We were especially mindful not to allow any exit of members within the 12-month timeframe. The case studies in the prescription contrasted the downsides of this point vividly. However, we felt that the concept of term tenure to be somewhat helpful they found it “too theoretical”. We hope to understand there is more explanation.

Q2) Please comment on the usefulness of the Tools 1

A2a) By Mr FA, CEO: Our team applied the gestation tool by adjusting our manpower schedule, roles and duties in accordance with gestation activities while also allowing for changes in conditions. The tool is not a static tool for us, but a flexible planning aid that allowed both individuals and our team to achieve a balance of gestation tasks suitably matched to their own academic studies. We reallocated gestation time frames based on actual efficiency of task completion. For example, we spent more gestation time on methodology search than expected in their initial plan. However, we compensated for it by combining its time allocation with that for the next gestation activity.

TAM is a just a tool, but the principle involved is important. We can adjust our gestation timings, but we are still accountable to one another, as well as to our stakeholders. Using TAM, members of gestation venture E were also able to synchronize gestation activities with other academic activities and personal

development. Two members managed to align the purpose and timing of a 2-month internship, which is part of their academic requirements, with the gestation activity on prototype creation. That planning flexibility prevented the exit of members, which could have resulted in gestation cessation as in fact had happed in the failed case study.

A2b) Mr. RO, the product development: I knew that I had to find support to acquire more know-how for creating and testing the prototype. I also knew that I needed to fulfill my academic internship. So, in order to meet our gestation goals and manage my graduation, our product design team decided to look for internship companies that allow us to achieve both. And we did it as a team and got things done on time!"

Q3) Does the prescription help to prevent the problem of lacking in competency?

A3a) The case study with failed outcome taught us to forestall competency inadequacy. During the interview, team members revealed that at the onset of the venture they were having about 30% of the competency necessary to create the overall prototype by the end of the 12th month. In this sense, then, the prescription was effective as an "early warning" and they considered the principle of competency compatibility useful.

Secondly, evaluation of TCC as a gestation tool showed that it was helpful in informing our members about their competency gap as against the requirements of the tasks. During the onsite gestation workshop, members of gestation venture E were then given the opportunity to discuss competency with their product advisory and incubation manager. The tool highlighted the competency gap of members and triggered an urgent search for competency development alternatives beyond the university environment.

A3b) Mr. RO, the product development: "It was during our presentation on competency compatibility that we considered various methodological options for product development. We discovered that there was a real competency gap with regard to our chosen methodology. Clearly, the TCC prescription of the program highlights the competencies that are not available to us. So we became motivated to find ways to learn and overcome these difficulties. Of course, we hope that there the prescription can provide us on how we can gain these competencies.

Q4) Does the prescription help your venture to reach prototype validation by end user thanks to resource configuration?

A4) Based on the third prescription of UVGP, our venture overcame the problem of failure of access to the gestation environment and successfully interviewed the President of Indonesian Midwives Association. Association members were their first target customers by the end of 12-month gestation. Firstly, members of gestation venture E overcame failure of access to the gestation environment by referring to the resource configuration of the case study with a successful gestational outcome. The members evaluated the principle of entrepreneurial bricolage as relevant because it reversed the perception that, by default, students do not possess resources and therefore would not be able to complete gestation.

I used to think that we do not have resources and that they were just a big dream that never comes true, the way students usually think. However, now I know we can reconfigure whatever we have (original business plan) and our resume (track record) to meet Ms. E, the President of Indonesian Midwives Association with confidence. Given her evaluation and feedback, I am ready to improve the prototype and have it ready for her institution in 2016."

Secondly, gestation venture referred to the Table of Resource Configuration (TRC) to consider the bundling of their key resources. Following the successful case study

of gestational venture N, the team reconfigured their original business plan into a fund raising research plan to call for a grant from an external, informal group of doctors and medical practitioners for the purchase of input materials. Next, the team used the TRC as a reference table to explain their 12-month resource configuration when presenting it to Ms. E, the President of Indonesia Midwives Association. They received favorable comments and the opportunity for gestation continuity.

During our interview with Ms. E, President of Indonesia Midwives Association, she told us that our prototype is good, but still not adequate for current clinical usage. However, she was impressed that we are entrepreneurial enough to gather our own funding. She explain that we have a good track record as champion in the Business Plan Contest in Asia and we have completed a gestational prototype that will solve a medical problem far beyond this group of undergraduate students. That is why she was happy to open the door for them to see our team again and conduct a demonstration class in her institution with their revised prototype. She offered her institution can be an experimental bed for us which confirm the outcome of our gestation.

Appendix IV

Survey question for development of design solution

with Informants of Entrepreneurship activities

Purpose:

Kindly spend about less than 20 minute to fill the survey for us to improve the understanding of "Venture gestation" from the perspective of an Evaluator

*Please write the answer in your choice of language: either English or Japanese

*Please leave blank for bolded area

Question	**Rating (From 1 to 5)**	**Remarks (suggestion)**
Q1) Please rate the **level of understanding** for the **definition** of Internal Capability from the manual *(1 point :Unable understand at all ⇔ 5 points : Able to understand clearly)*		Reason:
Q2) Please rate the **level of usefulness** of Internal Capability as an essential criteria in the assessment a startup *(1 point :Not useful at all ⇔ 5 points : Very useful)*		Reason:
Q3) Please rate the **level of appropriateness** of each indicator for Internal Capability (*1 point :No appropriate at all ⇔ 5 points : Very appropriate)*		
a) Activity Timeline and Resource Support (TSR)		Reason:
b) Task and Competency Compatibility (TCC)		Reason:
c) Resource Valuation and Configuration (RVC)		Reason:
Q4) Please rate the **level of usefulness** of the **template table** provided in the manual for each indicator of Internal Capability. Suggest any improvement *(1 point : Not useful at all ⇔ 5 points : Very useful)*		

a) Activity Timeline and Resource Support (TSR)		Reason:
b) Task and Competency Compatibility (TCC)		Reason:
c) Resource Valuation and Configuration (RVC)		Reason:
Q5) Please rate the **level of relevance** of the **case example** provided in the manual for each indicator of Internal Capability *(1 point : Not relevant ⇔ 5 points : Very relevant)*		
a) Activity Timeline and Resource Support (TSR)		Reason:
b) Task and Competency Compatibility (TCC)		Reason:
c) Resource Valuation and Configuration (RVC)		Reason:
Q6) Please rate the **level of difficulty** for **measurement (scoring)** of each indicator of Internal Capability (*1 point : Not difficult at all ⇔ 5 points : Very difficult)*		
a) Activity Timeline and Resource Support (TSR)		Reason:
b) Task and Competency Compatibility (TCC)		Reason:
c) Resource Valuation and Configuration (RVC)		Reason:
07) Based on the business plan that you have evaluated, which business plan is **most appropriate case study** to highlight importance of "Internal Capability" that affect overall business plan scoring. And WHY?		Answer and reasons (give example):

08) Have your **level of understanding** of "Internal Capability" **change** before and after the evaluation as a judge/evaluator? If Yes, what are the changes? *(1 point :No Change ⇔ 5 points : A lot of Change)*		Reason:
09) Please rate the **potential value** of "Internal Capability" for **knowledge contribution** towards the field of entrepreneurship		Reason:
Q10) Please give any suggestion for improvement to		Suggestion:

Thank you for precious time and knowledge contribution for our research in entrepreneurship!!!!

Appendix V

University Based Venture Gestation Program (UVGP) - Workshop I (with case studies)

SOI Asia
Business Plan Contest 2014
Workshop I

"Creating a Winning Business Plan?"

4 November 2014

Goi Hoe Chin
Contest Coordinator
SOI Asia Business Plan Contest 2014
goihoechin@gmail.com

House rules

When you wish to speak, on the microphone
When you finish speaking, mute the microphone

When you are listening, mute the microphone

When you have comments or question

1) Ask during Q &A
2) SKYPE: nihejin
3) Facebook: Goi hoe chin
4) Email "goihoechin@gmail.com" after the workshop

The workshop will be recorded and upload contest website

You are entrepreneur, be hungry for knowledge

Introduction of participants

5 Countries
6 Top Asian Universities

Contest Workshop I : "Creating a Winning Business Plan?"

4 Nov (Tues), 17:30 – 19:00 (GMT+9hrs)

Timing	Program	Personnal
1730-1800	Introduction Business Plan Contest and Template	Goi (KEIO Site)
1800-1830	Presentation of Two Business Plan (10mins each) a) Medical Information system -By Nanmedica Team (Contest Winner 2012) b) Medical Equipment -By KYUSI Team (Contest Winner2013)	Nanmedica (UB site) KYUSI (KEIO site)
1830-1850	Criteria of "convincing Business Plan" by external guest Mr Kazuya HIROKAWA Incubation Manager, SFC-KEIO Incubation Village	Mr Hirokawa (KEIO Site)
1850-1855	Discussion "Which is an Winning Business Plan, Why ?" - Nanmedica Vs Kyusi a) Entrepreneurship b) Business Model c) Internal Capability	All
1855-1900	Closing	Umejima (Utasaka site)

(II) SOI Asia
Business Contest 2014

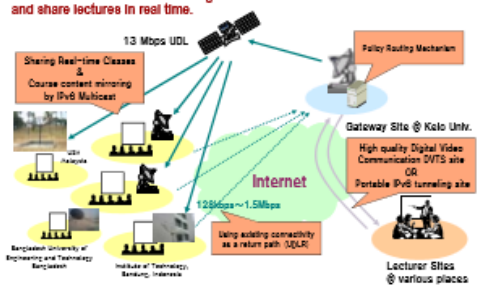
SOI ASIA Project

the GLOBAL EDUCATION Platform in ASIA
- 28 universities in 14 countries –

Details are at http://www.soi.asia/

SOI Asia

as an E-learning system
Connect 28 universities on the high bandwidth internet and share lectures in real time.



Background and objectives

- Hosted by SOI Asia Business Platform LLP, supported by SOI Asia Universities, since 2008
- To cultivate the potential entrepreneurs in the Asian region technological entrepreneurs in the region
- To prepare for venture opportunity for feasible research asset originated from universities

Contest Incentives 2014: For Winner

1. **Certificate recognition** as "Best Business Plan" amongst SOI Asia Universities
2. **Incubation (online and onsite)** business plan via SOI Asia system (monthly, up to 6-9 months)
   eg (I) To support in product research and development
   (direct advice and assessment from overseas expert)
   eg (II) To increase understanding of entrepreneurial mindset and behavior
   (direct interview and interaction with overseas student entrepreneur)
3. **Overseas guest speaker presentation opportunities** in one of SOI Asia Universities,
   As a used case based on 12-months performance in business plan creation and development
   (with Air-ticket and accommodation to be covered for two selected representatives)

** Note : Team can be more than 2 or more members*

Contest Incentives 2014:

For all Finalists (Top 5 plans):
Certificate recognition as "Top Finalist of Business Plan Contest" amongst SOI Asia Universities

For All Participants:
Evaluation opportunity by industrial professionals
Good Resume for future internship or job opportunity

Schedule

Phase	Date	Activities	Platform
Phase I : Submission of Business Plan	25 Nov 24:00 GMT+9	Final Submission of business plan	Contest Website
Phase II : Finalist Announcement	5 Dec	Announcement of Finalist	Contest Website and email
Phase III: Final contest and Announcement	17 Dec 11:10 - 12:40 GMT+9	Final Presentation	Lecture
	5 Jan 2014	Announcement of Results	Contest Website and Lecture

Incentives

For Winner:
- Air ticket and accommodation for visiting one of SOI Asia partner universities

For Finalists:
- Certificate is given to all the contest finalists

For All Participants:
- Evaluation opportunity for business plan be judged by prominent judges:
  - Consultant (KPMG)
  - Academics (SOI Asia Universities)
  - Director of SOI Asia
- Resume for future internship or job opportunity

Appendix VI

University Based Venture Gestation Program (UVGP) - Workshop II (with case studies)

SOI Asia
Business Plan Contest 2014
Workshop II

"How to action beyond business Plan?"

12 November 2014

Goi Hoe Chin
Contest Coordinator
SOI Asia Business Plan Contest 2014
goihoechin@gmail.com

House rules

When you wish to speak, on the microphone
When you finish speaking, mute the microphone

When you are listening, mute the microphone

Slides are controlled locally, refer to heading or page number

When you have comments or question

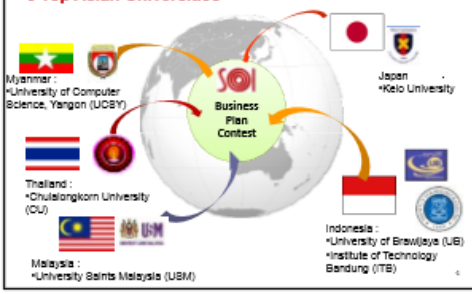
1) Ask during Q &A
2) Email "goihoechin@gmail.com" after the workshop

The workshop will be recorded and upload contest website

Introduction

Introduction of participants

5 Countries
6 Top Asian Universities



Outline

I) Concept of Venture Gestation

II) 3 Key problem of Venture Gestation
- *Case study : Netmedics Team versus Kyubi* Team

III) 3 principles + 1 Theory for gestation success

IV) 3 Tools for venture gestation

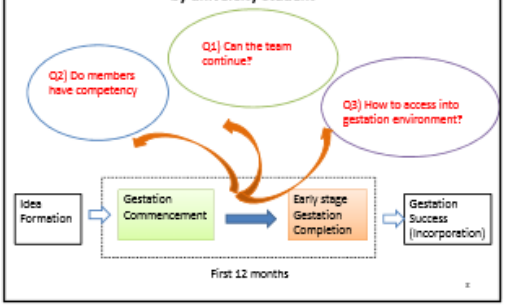
V) Application for gestation planning

Background

- Concept of **"Gestation"** originates from the introduction of the term "nascent venture", which first appeared in journal by Reynolds & Miller (1992)
- **"Gestation"** is described as a process from conception of idea till birth of *venture** (Reynolds & Miller, 1992).
  Venture is any organization with formal structure with legal entity, formed by one or more individuals, for profit or non- profit purpose
- **"Gestation venture"** is the venture that undergoes the stages of gestation.
- Study **"venture gestation"** based on how gestation venture transform an idea from birth to incorporation of a venture.

Part I: Problem Identification

Current Situation:
3 problems during venture gestation (early stage) by university student



Learning from
Two case study
-Winners after the contest

Contest winner 2012 Netmedics –Medical Information system	Contest winner 2013 KYUBI –Medical Equipment

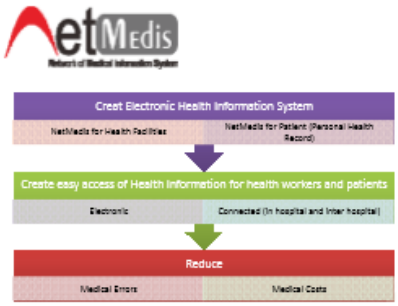
Case Study 1:

Team Netmedics
(Gestation Success)

https://youtu.be/NSJPORJB_J0

Netmedics- Background

1. Formed by a group of five students from University of Brawijaya (UB), Indonesia in January 2012.
2. combination of third year undergraduate students , various faculties, such as medical, information system, mechanical and business dep
3. Become contest winner in 2012/13.
4. Business Plan: To design on the development of information system for "Outpatient Medical Consultation and Payment system for UB Polyclinic



Gestation Activities

Venture Time	Gestation Activities
Jan 2013	Won Champion of BOI Asia Business Plan Contest
Jan- Mar	Preparation and actual Field trip to Japan as Contest Champion prize
Mar –Aug	No resource or environment for implementation
July-Aug	Breakdown of management members
Aug – Sep	Join the research contest organize by Ministry of Trade, Indonesia
Sept 2013– Nov 2014	Formation of 2nd generation Management team
Jan- April 2014	Preparation and complete Academic thesis based on medical information system project
Oct- Nov 2014	Preparation and complete educational case study based on venture gestation
Jan 2015 onwards	Establishment of Venture

Gestation Process of N venture (Jan 13- Jan 15)

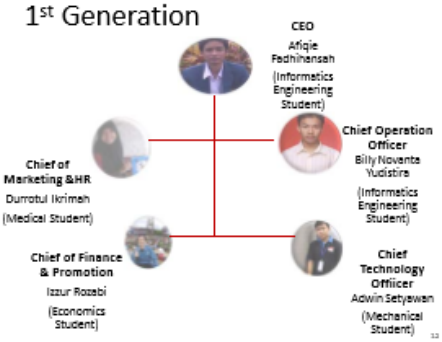
Gestation Goal :
To create Medical Information Network System and database for hospital

Gestation Problem	Venture response
1) 4 members inactive after 6th month -> left active CEO	CEO reconfigured management team -> recruit 3 new members from same faculty -> New member form venture core competency
2) Lack competency by CEO	
3) Lacking of funding to develop software	CEO reconfigured biz plan for research contest ->won research funding
4) Unable to access into hospital environment	CEO reused research plan and contest track records ->sign MOU with Uni Polyclinic and enable R&D

Adoption of product by Uni. Polyclinic

N Venture establishment (Jan 15)
-> 5 members + 2 advisors
-> Core competency
-> Product

1st Generation



2nd generation

Funding from Ministry of EDucation

Outcome:
Implementation Information system in Brawijaya university teaching hospital

Case 2: Team KYUBI

Gestation ceased (terminated)

KYUBI- Background

- Formed by 5 undergraduate students from University of Brawijaya (UB) in 2013.
- 4 of them were from Faculty of Electrical engineering and 1 member from Faculty of Economics, in University of Brawijaya.
- Become contest winner 2013/14.
- Proposal :To create a diabetes therapeutic medical device, which could heal bacteria infected wound and prevent amputation on patients, as an innovation for the medical engineering field

Gestation Activities

Gestation period	Gestation Activities
Oct 2013-Jan 2014	Won Champion of SOI Asia Business Plan Contest
Jan- Feb 2014	Planning for gestation
Mar – July 2014	Proposal for Product development
Aug 2014	Cease of R&D
Sept 2014	Departure of Management team
Nov 2014	Preparation and complete educational case study based on venture gestation
Dec 2014	Contribution of Enhanced R&D with prototype to university Cease gestation activity
Mar 2015	Cease intention on venture gestation

Gestation Process of K venture (Jan - Dec 14)

Gestation Goal : To create wireless medical equipment for diabetes patient

Gestation Problem	Venture response
1) 3 members inactive after 6th month -> left 2 members	Prototype self enhancement cease on 9th month
2) Lack of competencies by 2 members	
3) Lacking of funding to develop equipment	No action
4) Unable to access into medical environment	Consulted Univ. medical Faculty No further action

Enhanced prototype contributed to Faculty

K Venture Cessation (Dec 14)

Management Team

Gaining competency to make protoype through academics in UB and Japan

Product advisory from academic in UB

Discussion with Mitsugi Sensei in KEIO Univ.

Discussion with Prof. Josaphat's assistant in Chiba Univ.

Background of two cases

Name of Organisation	N Nascent Venture	K Nascent Venture
Nature	Medical information system for hospital	Wireless Diabetes Treatment equipment
Industry	Medical , IT	Medical , Engineering
No of members	5 members	
University	Brawijaya University, Indonesia	
Educational level	Undergraduate level	
Commencement till end of Gestation	Jan 2013- Jan 2015	Jan 2014- Dec 2014
Period of gestation	24 months	12 months
Status of Gestation	Venture created (Jan 2015)	Product Development (Dec 2014)

Cross Case Analysis
Issue 1: Discontinuity of Management Team

- Inactive within 6-9 months of gestation process
- Cannot commit beyond as students
- Reasons : studies, job internship, marriage etc

N Venture
- Only 1 member
- Created 2nd management team
- 3 new members from faculty
- "lock in" commitment of new members for extended 6-month gestation

K Venture
- Only 2 members
- Lost member with potential key competency
- Did not form new management team

Issue 2 : Lacking of relevant competency

Lacking in competency for required gestation activity by remaining members

N Venture
- Left 1 member, CEO as active member.
- CEO lacked IT and medical skills
- Recruited new members who have programming and database management skills .
- Formed core competency to develop medical information system

K Venture
- 2 members left
- Mr F, CEO lacked the core competency for the technology
- Mr B, remained but did not have relevant skill
- He became "back bencher"

Issue 3 : Lacking of resources access and reconfiguration

Both venture lack the resources (environment, funding) to develop the next gestation activity

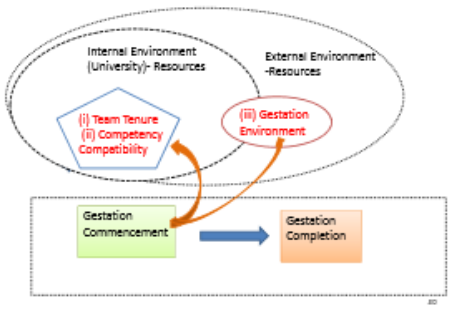
N Venture
- CEO **reconfigured** the business plan into a research plan for research contest
-> received funding

- CEO **reconfigured** research plan, successful track records, funding and Univ. recommendation
-> received MOU from Uni. Polyclinic, access into environment for product R&D

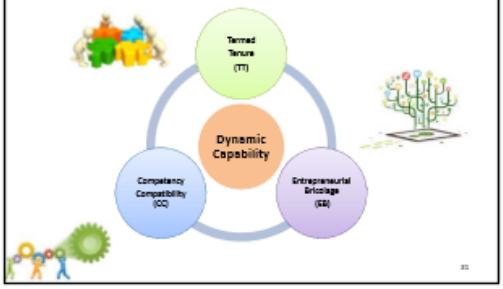
K Venture
- Venture self enhanced the prototype
- Contribute prototype to faculty

Part II: 3 Principles and 1 Theory

Need for creation of Venture Gestation Model



Venture Gestation Model (VGM)
- 3 principles using Dynamic Capability Approach

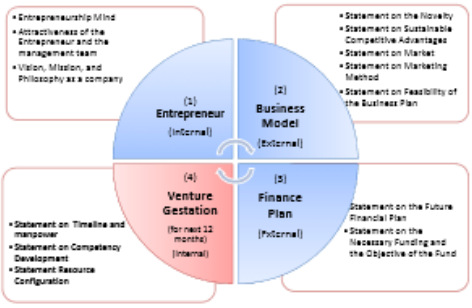


(VI) Venture Gestation Model (VGM)

Definition of Dynamic Capability

The **organizational capability**
- to create **termed tenure** structure,
- to **utilize and develop competencies**;
- to **access and reconfigure resources** from internal and external environment,
- in order to **complete gestation activities** under changing environment conditions.

Contest Criteria :13 Components （refer to template for details)



Important learning points

3 gestation problems ➡ 3 principles ➡ 3 Tools

Problem->Principle-> Tools

Gestation Problems	Design principles derived from literature review	Gestation Tools (Prescriptions)
Non permanence of founding team	Termed Tenured (TT)	**Table of Timeline Activity and Manpower planning (TAM)**
Competency inadequacy of existing members	Competency Compatibility (CC)	**Task and Competency Compatibility Plan (TCC)**
Inaccessibility into gestation environment desired for validation by end user	Entrepreneurial Bricolage (EB)	**Table of Resource Configuration (TRC)**

Part III: 3 gestation Tools

"Venture Gestation" criteria (new)

- to judge how feasible and attractive for student to create and complete validation of minimum prototype by end users within next 12 months (Jan till Dec 2016)

(successful gestation will result in business and readiness for venture incorporation later)

1. Statement on Timeline and manpower
2. Statement on Competency Development
3. Statement Resource Configuration

(4) Venture Gestation (for next 12 months) (Internal)

Part IV) Venture Gestation Plan

Table of Timeline Activity and Manpower Planning (TAM)

- Explain the process with the require manpower planning to create a minimum prototype till validation from end users within next 12 months

Key Question	Answer
11. Table and statement on ability to action business process, with manpower plan for next 12 months a)Please describe how the process to create	

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Part IV) Venture Gestation Plan

Table of Competency Compatibility (TCC)

- Explain your competency development plan to create a minimum prototype till validation from end users within next 12 months

Question	Statement
12. Table and statement on compatibility compatibility a) Please describe the key competencies required to complete the minimum prototype in 12 months b) Please describe how to gain the competency through internal and external environment	

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Part IV) Venture Gestation Plan

Table of Resource configuration (TRC)

- identify the key resources that can help you to access in environment to validation prototype from end users within next 12 months

Key Question	Answer
13. Statement on ability to create resource configuration for business process a) Please describe the gestation environment needed for prototype validation b) Please describe key resources (tangible and intangible) possessed by firm in next 12 months that make you eligible to enter the environment for validation eg: need "research plan"+ "unique track records" (resource) to be eligible for access into "hospital" (environment) to validate medical device	

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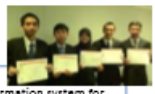
Case Examples : Contest Winner 2014



Business Plan:
1. To design on the development of information system for "Outpatient Medical Consultation and Payment system for UB Polyclinic

Gestation Goal in first 12 months:
To describe how to development of information system and receive validation from polyclinic (Customer and end users)

(4) Venture Gestation (for next 12 months) (Internal)

(I) statement on ability to action business process, with manpower plan for next 12 months

Normal answer:

My company will have 5 great, committed members. I believe as classmates and friends, they will stay as a team for 12 months to complete the project.

(I) Table of Timeline Activity and Manpower Planning (TAM)

Good answer : with narratives or evidence

Tenure Goal and Activities		Tenure team		Tenure Duration		Outcome	
Goal	Gestation Activities	Team	Pax	Time	Time	Outcome	Outcome Assessment
To complete prototype for validation by end users with minimum acceptable standard	Creation of Business Plan	(1st generation (Founding team)	5 pax	Nov –Dec	2 mths	Plan Created	Able to Completed
	Identification of methodology			Jan- May 15	5 mths	Identify two methodology	Able to Completed
	Prototype creation			Jun-Oct 15	2 mths	Prototype Trial and experience	Able to Completed
	Validation			Nov 15	1 mth	Validation by Academic and Industry and users	Able to Completed

(I) Table of Timeline Activity and Manpower Planning (TAM)

Good answer : with narratives or evidence

S/N	Name	Period	Duration	Academic level	Academic Background	Role	Competency	Stay/ Exit
1	Mr F	Nov14 -Nov 15	11 mths	3	Electrical	CEO	Management	Stay
2	Mr R	Nov 14- Nov 15	11 mths	3	Information	CTO	System	Stay
3	Mr A	Nov 14- Nov 15	11 mths	3	Information	Design	Design	Stay
4	Ms T	Nov 14- Nov 15	11 mths	3	Medical	R &D	Research	Stay
5	Ms N	Nov 14- Nov 15	11 mths	3	Electrical	Marketing	Fund raising	Stay

(II) Table of Competency Compatibility (TCC)
(to overcome lack of competency to create product)

Normal answer:

Our team members only self study and meet our lecturer once a week.

We promise that we can gain competency to finish the innovative product by 12 months.

(II) Table of Competency Compatibility (TCC)
(to overcome lack of competency to create product)

Good answer : with narratives or evidence

Time	Gestation stage	Acquisition of required competency gain (new)	Source (new)	Outcome
Jan-Mar 15	Methodology search	Competency on computer language	External	10%
Jan- Mar 15	Methodology search	Standard operational procedure (SOP) for system in hospital	Internal	10%
May- July 15	Methodology and prototype creation	Competency on creating Integrated database	External	20%
Aug 15	Design and creation of prototype	Learning about users needs	External	20%
Aug- Oct 15	Design, testing of prototype	Design of prototype and overall configuration	External	40%
Nov 15	Industrial validation	Improvement of design and functionality of prototype	External	100%

(III) Statement Resource Configuration for accessing into gestation for validation by end users

Normal answer:

My company can receive validation from president of Indonesian Midwives association because we have prototype and are undergraduate students in XX university

(III) Table of Resource configuration (TRC)

Good answer : In narrative form with evidence

S/No	Resource	Description	Origin of Resource	Remarks on bundles component
1	Business plan (version 4)	•Reconfiguration of Contest Business Plan	Internal	Inimitable (copyright)
2	Track records	•Champion in SOI Asia Business Plan contest •Make overseas presentation	External	Valuable
3	Fund raised USD 2000 to continue validation	•From angel grant	External	Valuable
4	Prototype 90 % (with pictures)	•12 months gestation	Internal	Inimitable

Q & A

Contest Schedule

Date	Event	Medium
11 Dec (Fri) 2400hrs	Submission of Business and Gestation Plan (BGP)	SOI Asia Website
13 Jan (Wed) 1110-1240hrs	Final Presentation (Finalist only)	SOI Asia via Lecture

* *Late submission are not accepted*
* *All timings are GMT+9 (Japan timing) (please adjust to own local timing)*
* *Top 5 finalists will be announce on 22-24 Dec 2015*

Submission on Contest Website


4. Submission Procedure

Please download this format [Click Business and Gestation Plan Template] and fill in your ideas to be submitted from the following file uploader by:

Date: 11 December 2015 (Fri), 24:00 GMT+9 (refer to Japan timing)

You can also use your own format, but we strongly recommend that you use the provided format

Please submit through the following

Choose a file to upload Choose File No file chosen

Upload File

For latest Information and enquiry

- Contest Website
  http://www.soi.asia/lectures/categories/89-entrepreneurship/331-business-contest-2015
- Contest Facebook:
  "SOI Asia Business and Gestation Plan Contest 2015"
- Contact :
  Goi Hoe Chin (Contest Master)
  (goihoechin@gmail.com)

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Appendix VII

University Based Venture Gestation Program (UVGP) - Business Plan Contest Guide with Evaluation Sheet

Appendix VII

Guide for

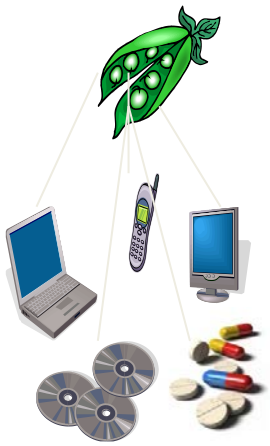
Business Plan Contest at SOI Asia 2014-2015

- Building the future from Asia -

- For All Innovators-

Version 2.0

Contest Evaluation criteria and business plan template is attached on this contest brochure!



1. **Paper submittion due is on Nov 26 24:00 JST [UTC+9]**
   Submit your business plan at the contest web http://www.soi.asia/lectures/categories/89-entrepreneurship/306-business-contest-2014Or Mail to Goi Hoe Chin [goi@sfc.keio.ac.jp],the contest coordinator for 2014
2. **Final presentation session is on Dec 18 11:10 JST [UTC+9]**

"Technology entrepreneurship gives us capabilities to prove whether our technology is accepted and can benefit to people, and may derive our economic incentives"

2008 Spring SOI Asia meeting in Keio, Japan

1. Reason why we need to promote Entrepreneurship in University

Being in the academia, we all aspire to improve lives of our people by knowledge creation, especially through technology development. But technology alone is not good enough: We need bridging between technology and Society. Making Business is one of those “bridges” and enables sustainable use of the technology.

1.1. Our definition to Entrepreneur and design about Business Plan contest

SOI Asia project, which is the higher education networking among Asian leading Technology universities, has hosted a business plan contest aiming at fostering the environment for technology entrepreneurs in the region since 2008. This contest is one of the projects for SOI Asia Technology Entrepreneurship Initiative to realize the following concept, which was agreed by university presidents at the 2008 Spring AI3/ SOI Asia meeting in Tokyo.

Figure1 Concept to Entrepreneurship

There are many incubating activities to promote a university startup. However, we have recognized those activities, e.g. a business plan contest, have faced three major challenges. First is the lack of staff, specializing on incubating technology entrepreneur. Second is the lack of budget for providing the support environment, e.g. incubating facility and professionals for brushing up business plan. Third is the high searching cost to find appropriate venture capitals enabling to satisfying university startups.

SOI Asia business plan contest is intended to provoke solution to this third challenge with reducing searching cost between a university startup and a venture

capital, therefore this contest has addressed the clearing evaluation process policy. This policy is applied to the disclosure to evaluation criteria and its outcome.

Finally, SOI Asia Business Platform LLP as the contest organizer keeps searching appropriate venture capitalists in Asia. At this moment, SBI Investment[http://www.sbigroup.co.jp/english/], Japanese one of biggest venture capitals, and Global Brain [http://www.globalbrains.co.jp/english/], Japanese hands-on typed venture capital, has been registered as the partner fund for SOI Asia project signing MOU with the contest organizer.

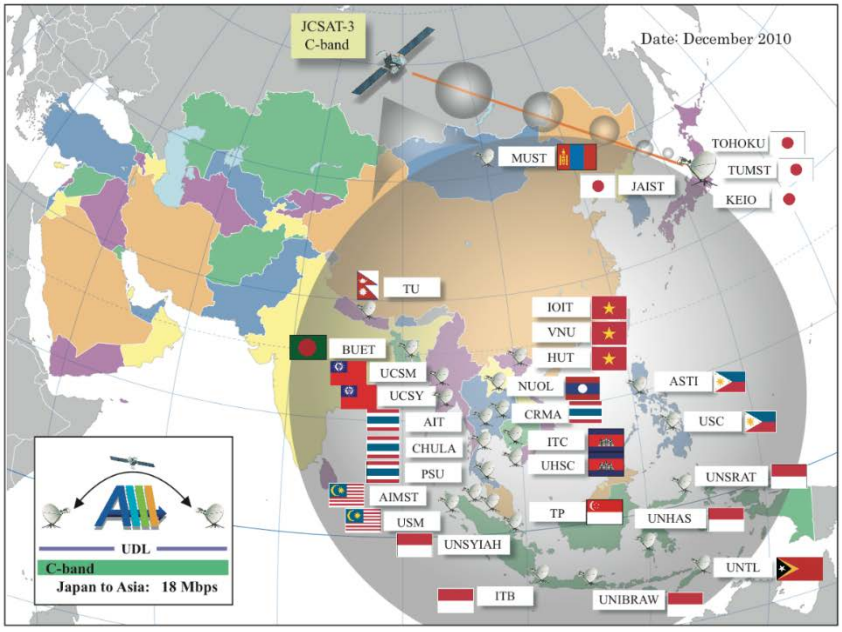


Figure2 SOI Universities

What is SOI Asia Business Platform LLP?

SOI Asia Business Platform LLP is a newly launched partnership organization. LLP (Limited Liability Partnership) is a form of partnership often used in UK and USA to promote collaborative work among independent economic entities and has become an important tool to bridge non-profit universities and for-profit companies. Keio University, as non-profit organization, cannot take part in profit making company activities directly and cannot receive reward for economic success directly.

Thus SOI-Asia staffs residing in Japan established LLP with collaborative agreement with Keio to bridge Japanese investor interests and SOI-Asia interests. The LLP, by charter, does not seek profit for itself or its members, and its operating cost is mainly covered by contingency incentive to bridging operation between SOI-Asia interests and Japanese investors.

2. Outlook for Business Plan Contest at SOI Asia 2014

2.1. Differentiation from the other existing business plan contests

There are two major differences this contest has as follows:

- Disclose evaluation criteria in advance
  - This evaluation sheet was developed with arguing to venture capitalist, accountant, consultant, business executive, researchers at university, and faculty at university. In addition, we adopt high disclosure policy including criteria for contributing your business plan improvement. Therefore, you could penetrate on your strength when you promote your business plan in front of contest judges and your business stake holders such as an investor.

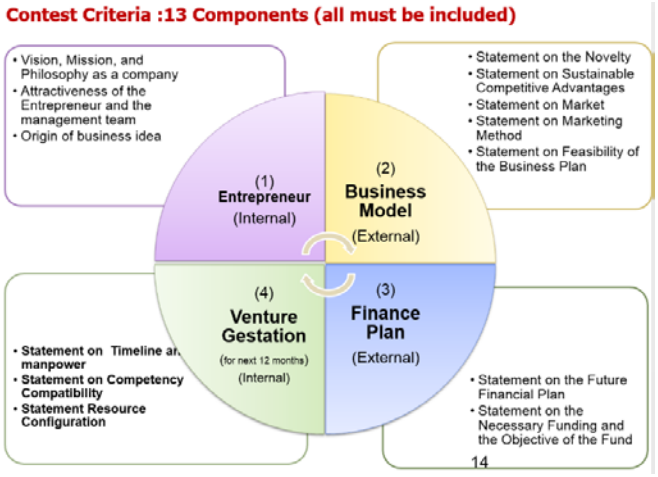


Figure3 Contest Criteria in 2014

  - We invite judges from multiple fields. First group of judges is from SOI partner University faculties who are specialists in management and administrations based on voluntarily participation. Second is from industry fields: IT technology, Management, Intellectual Property, Financial Sector, and Accountant. Third group is all of the directing members of SOI Asia Business Platform LLP.
  - Contest judges are required to announce NDA agreement in advance.

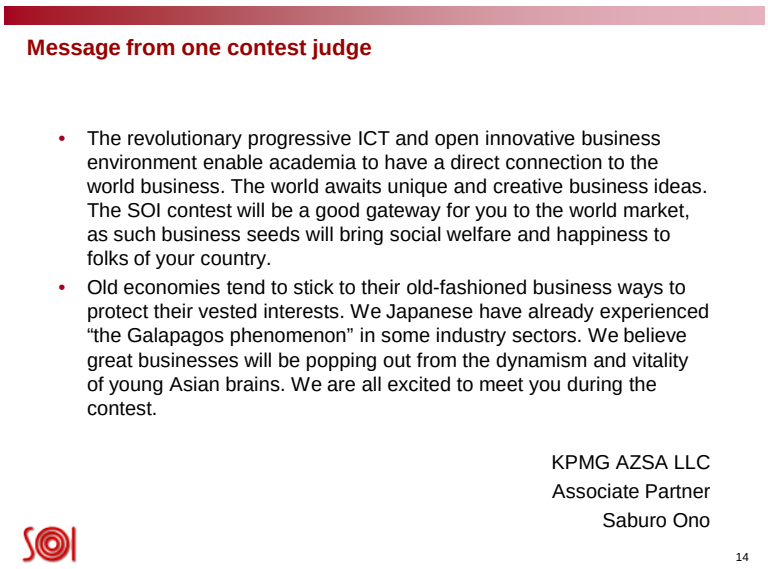


Figure3 Comment from the Contest judge in 2010

2.2. Theme of the Contest: Free theme, any business plan is welcomed

Any themes of the business plan are welcomed. However the business plan, basing on the research outcome in your university's laboratory is highly appropriated.

2.3. Contest's evaluation process:

- 1st Round：paper judge: Nov 26, 2014, 24:00 +0900 (JST)
  - Results at 1st round would be delivered by e-mail by Dec 8.
- 2nd Round: presentation judges: Dec 17, 2014, 11:10-12:40+0900 (JST)
  - 10 minutes presentations by four finalists, who are qualified at 1st round.

2.4. Submission form: How to submit your business plan?

Please download the Business plan template, which tells you how to write the business plan from your technology, at the contest web.

Of course, we are welcoming you use your original format to write your business plan, but every business plan must include essential components, which our business plan contest template has indicated. There are three essentials. First is fiscal projection, e.g. cash flow, P/L and BS. Second is management team description, which is attributed to show practicality about your business plan. Third is tangible market description at local and your penetrating market with keen analysis.

2.5. Prize

- Award
  - The winner at Business Plan Contest at SOI Asia 2013

- ✧ Finalists at Business Plan Contest at SOI Asia 2013

➢ The contest winner prize in 2013

- ✧ Air ticket and accommodation for visiting one of SOI Asia partner universities

Figure4: SOI Asia partner universities Figure5: Picture of the contest winner in 2012

➢ Certificate

- ✧ Certificate is given to all the contest finalists

2.6. Language

Your business plan and presentations should be prepared in English.

2.7. Reference: for further inquiry

If you have questions and need more details about this business plan contest, mail us at entre-course@soi.asia

Reference :

Evaluation Sheet

Established on Oct 2008

Business Plan Contest at SOI Asia 2014
- Building the future from Asia -
Evaluation sheet

SOI Asia Business Platform LLP will host SOI Asia Business Plan Contest 2012 which provides matching for Technology Entrepreneurs to receive funding aiming to promote technology development in University and business development in parallel.

This Evaluation sheet is what the judges will use in the SOI Asia Business Plan Contest 2012 as the primary business evaluation which discloses all procedures at the next page.

Who is Technology Entrepreneur?

“Technology entrepreneurship gives us capabilities to prove whether our technology is accepted and can benefit to people, and may derive our economic incentives”

2008 Spring AI3/ SOI Asia meeting in Keio, Japan

Evaluation Sheet:

Please mark your judgment in each criterion in the scale of one to five, five being the highest and one being the lowest.

Rough guidance of the each scale is indicated as followed. Please make a judgment in **absolute evaluation**, not on the curve evaluation.

5: Most Outstanding:	Top ranking. Holds strong potential in making a major change in society in the future
4: Outstanding:	Entrepreneur worth noting for this award. Holds strong potential to become a successful company (management team)
3: Average:	Passing Level. Holds possibility to become a successful company (management team) if met with right terms and conditions
2: Below Average:	Holds possibility, but will require extensive brush-up
1: Difficult:	Lowest level. Holds little potential in becoming successful company

(1)Entrepreneur Evaluation

① Entrepreneurship Mind: Reason for the start-up, enthusiasm toward the business

Please evaluate the entrepreneur's enthusiasm, passion, and motivation toward the business based on the process/reason for the start-up

Evaluating Points|----------|----------|----------|----------|
5 4 3 2 1

② Attractiveness of the Entrepreneur and the management team

Please evaluate the entrepreneur's attractiveness and the management team's attractiveness including the potential attractiveness fostered in the future.

Evaluating Points|----------|----------|----------|----------|
5 4 3 2 1

③ Vision, Mission, and Philosophy as a company

Please evaluate the management philosophy (or vision and mission regarding the business) based from the strategic stand point of the management.

Evaluating Points|----------|----------|----------|----------|
5 4 3 2 1

(2)Business Model Evaluation

④ Statement on the Novelty

Please evaluate the creativeness of the business and potential innovation to bring in breakthrough into the society.

Evaluating Points	5	4	3	2	1

⑤ Statement on Sustainable Competitive Advantages

Please evaluate the core skill/technology of the business – the uniqueness that does not allow the others to follow, and/or the competitive advantage over the competitor, and/or primitive advantage in the management strategy.

Evaluating Points	5	4	3	2	1

⑥ Statement on Market

Please evaluate the target market (including the potential market) the business has specified and accuracy of the description.

Evaluating Points	5	4	3	2	1

⑦ Statement on Marketing Method

Please evaluate the marketing/sales strategy including communication process of the service/product to the market, price setting, and promotion method.

Evaluating Points	5	4	3	2	1

⑧ Statement on Feasibility of the Business Plan

Please evaluate the business plan feasibility on the feasibility itself and the precision of the plan.

Evaluating Points	5	4	3	2	1

(3)Finance Plan

⑨ Statement on the Future Financial Plan

Please evaluate focusing on the precision and the feasibility of the sales/cost estimate for the next three years, and the cash flow plan.

Evaluating Points|----------|----------|----------|----------|
5 4 3 2 1

⑩ Statement on the Necessary Funding and the Objective of the Fund

Please evaluate the accuracy of the plan on the objective of using the fund invested through this process.

Evaluating Points|----------|----------|----------|----------|
5 4 3 2 1

(4) Venture Gestation

Attractiveness and feasibility of Timeline Activity and Manpower Planning

Please evaluate whether this company is attractive and has the ability to achieve founding team stability by end of 12 –month gestation

Evaluating Points|----------|----------|----------|----------|
5 4 3 2 1

Attractiveness and feasibility of competency compatibility

Please evaluate whether this company is attractive and has the ability to gain the competency to complete the prototype by end of 12 –month gestation.

Evaluating Points|----------|----------|----------|----------|
5 4 3 2 1

Attractiveness and feasibility

Please evaluate whether this company is attractive and has the ability to reconfigure the resources from internal and external environment to gain validation from end users by end of 12 –month gestation.

Evaluating Points|----------|----------|----------|----------|
5 4 3 2 1

Appendix VIII

University-based Venture Gestation Program (UVGP) -Onsite Incubation Program

Appendix VIII

Onsite Incubation Program
in University of Brawijaya

(22 Feb - 25 Feb 2015)

Objectives:

i) Onsite Incubation for contest winner 2014:

a) The goal setting, resource and competency needs for development of Hemorrhagic detector (Product perspective)

b) Internal capability development of Edhet Company (Organisational perspective)

ii) Review of past entrepreneurship projects on past contest winner 2012, 2013:

a) To interview and discussion on business creation with Netmedics (contest winner 2012) and KYUBI (Contest Winner 2013)

b) Case study development

iii) Discussion with Entrepreneurship Academics:

a) To discuss about development of SOI Asia Business Plan Contest

b) To discuss about development of Internal capability

c) To understand the focus on entrepreneur education and incubation development in UB in 2015

Date : 22 Feb (Sun) – 25 Feb (Wed) 2015

Program (tentative) :

Date	Timing	Program	Venue	Personnel Involved
22 Feb, (Sun)	0750-0915hrs	Departure from Singapore to Surabaya Flight SQ0930 (SQ)	Nil	Nil
	0930-1200	Travel from Surabaya to Malang	Nil	Obi
	1230-1330	Lunch with Edhet		Edhet
	1330-1500	Meeting with Edhet (session I) "Development of Edhet after Contest"	PENA	Edhet
	1500-1630	Updates of "Medical Information System" from Netmedics	PENA Office	Netmedics (Imm, afique, Romdan)
	1630-1800	Visitation and meeting with PENA (Pejuang Economics Nusantara)	PENA Office	Obi and PENA

		(student entrepreneurship Company)		
	1800-1930	Dinner	To be confirmed	PENA,Netmedics, KYUBI, Edhet
	2000-2130	Updates of all SOI Asia Entrepreneurship Activities and Individual contest winner development	PENA or Hotel	Obi, PENA, Netmedics, KYUBI, Edhet
23 Feb, (Mon)	0900-1030	Academic meeting - Review of SOI Asia Business Plan Contest - Updates for KYUBI, Netmedics - Discussion on venture gestation	UBEED	Professor Lilik and Pak Choiron
	1100-1200	Visitation to Edhet working environment Meeting with Edhet Advisor (session II) “Development of Hemorrhagic Detection Device” -with Mr Eka	To be confirmed	Mr Eka and Edhet
	1230-1400	Visitation to UB Hospital	UB Hospital	Netmedics (Afique)
	1400-1500	Lunch	To be confirmed	Edhet
	1500-1730	Meeting between Edhet with Past contest winner (Netmedics or KYUBI) (session III) “Comparison of venture gestation”	PENA	Edhet Netmedics (Romdan) or KYUBI (Fahad)
	2000-2130	Meeting Contest Participants “Feedback about contest and discussion on Contest”	PENA (To be confirmed)	Obi and Contest Participants
24 Feb (Tues)	1030-1200	Review of KYUBI Meeting with Pak Rudy and KYUBI	UB (Pak Rudy Office)	KYUBI ,Pak Rudy

	1200-1330	Lunch	Nil	
	1400-1600	Preparation by Edhet	UBEED	Edhet
	1600-1730	Presentation on Goal setting and Internal Capability by Edhet (session V)	UBEED	Pak Lilik/ Chorion Goi Edhet, Obi, Fahad
	1800-1930	Dinner	Nil	Pak Lilik, Pak Chorion Obi, Fahad, Im Edhet
	2000	Back to hotel	Hotel	
25 Feb (Wed)	1000-1200	Wrap up meeting with Edhet (session VI)	Hotel	Edhet
	1200-1300	Lunch	Nil	
	1300-1640	Transportation from Malang to Surabaya	Nil	Obi
	1840-2155	Departure Surabaya to Singapore Flight Silk Air MI0225	Nil	

Highlights for Onsite Incubation Program
22-25 Feb 2015

Date	Timing	Program	Photos
22 Feb, (Sun)	13.00 – 16.00 WIB	Speaker in UB in entrepreneurship Seminar (PENA, Participant Contes SOI Asia, EDHET) Meeting The Contest Participants 2014 Session (Contest Evaluation and Internal Capability)	
	18.00 – 21.30	Meeting with Edhet (session I) "Development of Edhet after Contest"	
23 Feb, (Mon)	20.00 – 21.30	Meeting between Edhet with Past contest winner (Obi and Widi) "Comparison of Internal Capability"	

24 Feb (Tues)	16.00 – 17.15	Presentation on Goal setting and Internal Capability by Edhet (session V) (Chorion, Go, Edhet, Obi, Fahad)	
	20.00 – 21.30	Sharing with Past contest winner (Netmedics, KYUBI)	
25 Feb (Wed)	08.00 – 09.00	Edhet make second presentation their “Internal Capabillity” to panel of electrical lectures (Pak aziz, pak unggul, bu rosa, pak rudy)	
25 Feb (Wed)	10.00 – 11.00	Wrap up meeting with Goy sun (Fadli, Arya, Romdhan, tami, Nurina)	

Appendix IX

University-based Venture Gestation Program (UVGP) - Case study of Gestation Venture E

University Based Venture Gestation Program (UVGP)

Case study : Gestation Venture E (Edhet Team)

Case Examples : Contest Winner 2014

Business Plan:
To create medical training Kit (with device)
For Hemorrhagic Detection (pregnancy over bleeding problem)

Gestation Goal in first 12 months:
To describe how to achieve validation of completed prototype by President of Indonesian Midwives Association (Customer and end users)

(4) Venture Gestation (for next 12 months) (internal)

Edhet- Background

- Formed up of 5 undergraduate students from UB
- From Faulty of Medicine, Informatics, and electrical engineering.
- Gestation goal of gestation venture E was to create and validate the hemorrhagic prevention device and training kit for testing and validation by their immediate partner, President of Indonesian Mid Wives Association

Gestation Activities

Timeline	Gestation milestones
Nov 14- Jan 15	Join SOI Asia Business Plan contest and creation of Business Plan
Jan -April	To learn about sensor matrix method "under advisory of Mr Marsudi, University Alumni
May- Aug	To learn image processing method Mentorship from Mr Firman, and Entrepreneur in SME Internship at robotics supplying company named "Depoinovasi enterprise", in Malang City
Aug – Nov	Product design and consultation at Gadjah Mada University with Mr. Prayit to learn about Loadcell dan Pump
Nov	Raised Funding of USDXXX through Research plan from external investor
Nov	Validation and Feedback of prototype by representative of Central Board Midwives Association , Indonesia (CBMA)

(I) statement on ability to action business process, with manpower plan for next 12 months

Good answer : with narratives or evidence

Tenure Goal and Activities		Tenure team		Tenure Duration		Outcome	
Goal	Gestation Activities	Team	Pax	Time	Time	Outcome	Outcome Assessment
To complete prototype for validation by end users with minimum acceptable standard	Creation of Business Plan	(1st generation (Founding team)	5 pax	Nov –Dec	2 mths	Plan Created	Able to Completed
	Identification of methodology			Jan- May 15	5 mths	Identify two methodology	Able to Completed
	Prototype creation			Jun-Oct 15	2 mths	Prototype Trial and experience	Able to Completed
	Validation			Nov 15	1 mth	Validation by Academic and Industry end users	Able to Completed

Activity Timeline and Manpower Planning

(I) statement on ability to action business process, with manpower plan (for next 12 months)

Good answer : with narratives or evidence

S/N	Name	Period	Duration	Academic level	Academic Background	Role	Competency	Stay/ Exit
1	Mr F	Nov14 -Nov 15	11 mths	3	Electrical	CEO	Management	Stay
2	Mr R	Nov 14- Nov 15	11 mths	3	Information	CTO	System	Stay
3	Mr A	Nov 14- Nov 15	11 mths	3	Information	Design	Design	Stay
4	Ms T	Nov 14- Nov 15	11 mths	3	Medical	R &D	Research	Stay
5	Ms N	Nov 14- Nov 15	11 mths	3	Electrical	Marketing	Fund raising	Stay

(II) Statement on compatibility Development Plan
(to overcome lack of competency to create product)

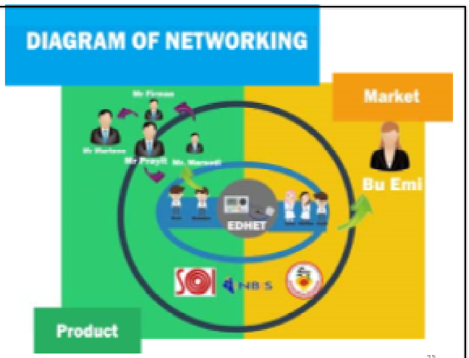
Good answer : with narratives or evidence

Time	Phase	Gestation Stage	Competency gain	Methodology	Source	Outcome
Jan-Aug	Methodology research	Methodology Search	Competency on "sensor matrix" method for device	Mentoring and training by Mr Marsudi University Alumni	External	10%
		Methodology Search	Competency on standard operational procedure (SOP) for birth delivery for Midwives	Co-Learning for team members. Academic Learning from Lecturer, Medical Department, UB	Internal	10%
		Methodology and Prototype creation	Competency on creating "image processing method"	Mentoring, training and incubation space by Mr Firman, CEO of local SME	External	20%
		Design and creation of Prototype	• Learning about blood sensor camera • Creation of Prototype • Free raw materials	Internship with local company [illegible] company, in Malang City	External	20%
Aug - Nov	Prototype design	Design, testing of prototype	Design of Prototype and overall configuration Learn about Infra Red Sensor methodology	Academic learning Mr Prayit, the Senior Physic Instrumental Researcher	External	40%
Nov	Validation by academic and end users	Academic Validation	Improvement of design and functionality of prototype	Validation and Feedback 1 (Mr. F, external university) 2 (Ms R, immediate advisor, UB (parent University))	Internal and external	Complete 80%
		Industrial Validation	Improvement of design and functionality of prototype	Validation and Feedback by Representative of Central Board Midwives Association (CBMA)	External	Complete 80%

(III) Statement Resource Configuration for accessing into gestation for validation by end users

Good answer : In narrative form with evidence

S/No	Resource	Description	Origin of Resource	Remarks on bundles component
1	Business plan (version 4)	•Reconfiguration of Contest Business Plan	Internal	Inimitable (copyright)
2	Track records	•Champion in SOI Asia Business Plan contest •Make overseas presentation	External	Valuable
3	Fund raised USD 2000 to continue validation	•From angel grant	External	Valuable
4	Prototype 90 % (with pictures)	•12 months gestation	Internal	Inimitable



Overcoming of the 3 gestation problems, with successful gestation outcome after 12-month by gestation venture E

The continuous team work by same members of founding team after 12- month gestation (Nov 2015)

Gain sufficient competency to complete prototype creation after 12- month gestation (Nov 2015)

Received validation of completed prototype from President of Indonesia Midwives Association after 12-month gestation (In Nov 2015)