

論文の要旨

題目 A Study on Decision Support for Managing Technology Incubator
(テクノロジーインキュベータ管理に対する意思決定支援に関する研究)

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Technology incubator is well known as the facilities for enhancing Small and Medium Enterprises (SMEs) competitiveness. Because of the popularity, technology incubators are established around the world. Technology incubator can be divided to three components of systems. Those components are selection, business support, and mediation (Bergek and Norman, 2008). However, the previous literature has exposed many problems facing the technology incubator program. The problems are the technology transfer failure during incubation process, the difficulties to provide financial support for the incubatees, and financial deficit that faced the incubators. Those incubator problems are linked and cannot be separated each other and influenced by all of the incubator system component. To date, however, no reports in the literature have proposed a model to solve the problems simultaneously, and solve those problem by considering the contribution of the technology incubator system components.

Selection process was viewed as important component of technology incubator success. Hackett and Dilts (2004) indicated that the most concerning factor in technology incubator model is related to the issues of incubatee selection. Aerts et al. (2007) survey incubator managers in Europe and find that European incubator managers do not screen their potential tenants on a wide and diversified set of criteria.

After the incubator manager conducted the appropriate incubatee selection process, the others important component in technology incubator are business support and mediation process. Since technology incubators cannot provide all the need of their incubatees, the incubator has role as intermediary or mediator between incubatees and relevant critical resources such as knowledge and technology, financial capital, marker related resources and human capital (Bergek and Norman 2008). However some difficulties is faced by the incubator manager to conduct mediation with the other parties especially with the investors who provide financial support. The main obstacles in obtaining financial support is difficulty in providing high collateral requirement related to firm-risk (Columba et al., 2010; Hanedar et al., 2014). Regard to business support and mediation component, this study concern to provide decision support for incubator manager as intermediary to financial provider or investor.

This study aims to solve the incubator problems and enhance technology incubator performance. Furthermore, in the modelling process, the important factors that influence the problem in all component of incubator system consist of incubatees selection, business support, and mediation part is explored. In the incubatees selection part, the study propose an interactive multi-objective model in order to incorporate different orientation of incubator manager as decision maker. To support the incubator manager in getting financial support for the incubatees from the investors, the study propose a profit sharing scheme and consider technological progress of incubatees as an important factor. By utilizing this study, the incubator manager will have holistic approach in overcoming the problems, and enhancing the performance of technology incubator.

The outline of dissertation as follows:

Chapter 1 Introduction

Chapter 1 is gives an explanation about research background, research position and problem definition. That is described the importance of the research and how the research can overcome the problems. The following outline of all chapters provides navigation to the dissertation content.

Chapter 2 Technology Incubator

This chapter describes the concept of technology incubator. Chapter 2 explores the types, roles of incubator, and indicates the performance measurement of technology incubator. The incubatees as the firm that incubated inside technology incubator is defined and characterized. Since technology transfer process is an important feature in technology incubator, the mechanism and the importance is explained. Furthermore, this chapter explored the literature on technology incubator-incubation research, defined research perspective, research stream and relationship with this study.

Chapter 3 An Interactive Multi-objective Incubatee Selection Model Incorporating Incubator Manager Orientation

Chapter 3 describes the new incubatees selection model in technology incubator. The selection is one of the important factors that influenced technology incubator performance. The proposed selection model defined the performances consist of incubatees profitability, survivability and worker absorption. The model considers the orientation of incubator manager as decision maker. For incorporating the different orientation, the model utilizes interactive Tchebycheff method to provide a set of alternative solutions. Using a set of alternative solutions, the model provides a degree of freedom in the analysis to accommodate DM orientation. Utilizing the proposed model, a decision maker can optimize incubator goals, thereby ensuring the survivability of the incubatee and the success of the technology transfer process.

Chapter 4 An Integrated Financial and Technological Support Model In Technology Incubator

Chapter 4 consider that the supports for the incubatees including technological and financial is related and cannot separated each other. This chapter provides a conceptual model and influence diagram that show the relationship of the financial and technological support for the incubatees. Moreover, the

chapter indicates some effect that might be happen and should be anticipated by the stakeholder and recommendation for future research.

Chapter 5 A Profit-Sharing Scheme to Provide Financial Support for Incubatees Considering the Technology Transfer Process

Continuing the conceptual model that shown in Chapter 4, chapter 5 explained the scheme to provide financial profit for the incubatees. In technology incubator programmes, several problems have been found. The problems are difficulties for obtaining the financial support that faced by the incubatees, the failure of technology transfer process, and incubator financial deficit. For overcoming the problems simultaneously, a profit-sharing scheme is proposed. In the model, the decision makers are consist of incubator manager and the investors, each of whom have different concern and interest. To cope different interest of the decision makers, the negotiation process is used. Then, the behavior and benefit of negotiation process is analyzed. In the model, the technological progress of the incubatees during incubation is considered as an important factors. The factors are certain value for the incubator manager and uncertain for the investor. Utilizing mathematical model, the numerical experiment derives the managerial implications for the decision makers.

Chapter 6 Conclusion

The study is summarized and the recommendation for future research are discussed in relation to the current study.