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EVALUATION ON STP PERFORMANCES: CASE STUDY OF UNIVERSITY'S STP IN INDONESIA

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Abstract

Initiatives of Science and Technology Park (STP) emerge to increase the ability of industries to generate technological innovation. The objective of this article is to evaluate the performance of STP through a single case study in STP A. The Balanced Scorecard (BSC) approach is selected to evaluate the performance of STP-A, due to its perspectives was a suitable measure that will inform STPs performances. Case study show evaluation of STP A in the aspect of financial, industrial cooperation, R&D based commercialization, and monitoring and improvement. Evaluation on financial aspect show good performance but still faced a problem related to the investment flexibility. In the aspect of industrial cooperation, STP-A also has a good performance, although still faced a problem in bridging the knowledge producer and industry. For R&D based commercialization and improvement, the case study also shows a good performance.

Introduction

Nowadays, the complexity of the market emerges due to diverse of consumer needs. These conditions forced response of the industries in order to survive in the changing market, in term of developing innovation. Innovation has a role in improving firm's performance, as well as to build their competitive advantages (Gopalakrishnan and Damanpour, 1996). Furthermore, technological innovation can generate added values for both product and services of a firm. Nevertheless, the firm requires certain resources to be able to produce technological innovation, for example, R&D unit and core competencies of certain technologies. In the context of the industry in Indonesia which is dominated by SMEs, lack those resources, due to limited financial investment. Based on this condition, initiatives of Science and Technology Park (STP) emerge to increase the ability of industries to generate technological innovation.

Science and Technology Parks (STPs) had objectives in support cooperation and technology transfer, especially between industries and knowledge producer such as universities and research institutes (Bigliardi et al., 2006). STP enable agglomeration between firms and knowledge producers (e.g. universities and research institutes) and promote cooperation in developing technological innovation. Moreover, agglomerations between parties in STP will provide geographical proximity between firms and knowledge producer. Torre and Gilly (2000) argue that geographical proximity increases the number of interactions, as well as facilitate the knowledge flows from knowledge producers to the firm. Related to generate technological innovation, Vasques-Urriago et al. (2016) found that STP promotes cooperation between firms and universities located in STP, which is producing technological innovation both through R&D activities and non-R&D activities.

Even though previous empirical studies show beneficial of STP in increasing firm's ability to produce technological innovation, evaluation of STP performance is still needed. The literature on STP's evaluation still limited, including both evaluation framework and tools. Silva and Forte (2016) propose the framework to evaluate STP performance but limited to the aspect of strategic capacity. Most of the literature on STP focused

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in the factors of design, beneficial and interaction within STP, rather than on an evaluation of STP performances. This case study uses the qualitative approach with a focus on the evaluation of STP performance. The case study is conducted in STP A of University in Bogor, West Java, Indonesia. The Balanced Scorecard (BSC) approach is selected to evaluate the performance of STP-A, due to its perspectives was a suitable measure that will inform STPs performances. The objective of this article is to evaluate the performance of STP A through a single case study.

Analytical Framework

In a management context, the BSC approach is commonly used as a strategy performance management tool. The BSC perceived as the most suitable framework to provide significant information pertaining to the organizational internal and external factors that will subsequently contribute to the organization's success (Shukri and Ramli, 2015). Kaplan and Norton (1992) introduced the BSC approach using four perspectives of measures to identify the performance of the organization, as follow:

- a. Financial: encourages the identification of a few relevant high-level financial measures. In particular, designers were encouraged to choose measures that helped inform the answer to the question "How do we look to shareholders?" Examples: cash flow, sales growth, operating income, return on equity.
- b. Customer: encourages the identification of measures that answer the question "How do customers see us?" Examples: percent of sales from new products, on time delivery, the share of important customers' purchases, ranking by important customers.
- c. Internal business processes: encourages the identification of measures that answer the question "What must we excel at?" Examples: cycle time, unit cost, yield, new product introductions.
- d. Learning and growth encourage the identification of measures that answer the question "How can we continue to improve, create value and innovate?". Examples: time to develop a new generation of products, life cycle to product maturity, time to market versus competition.

This study adopted four perspectives of the BSC approach for the context of STP as an organization, as shown in Figure 1.

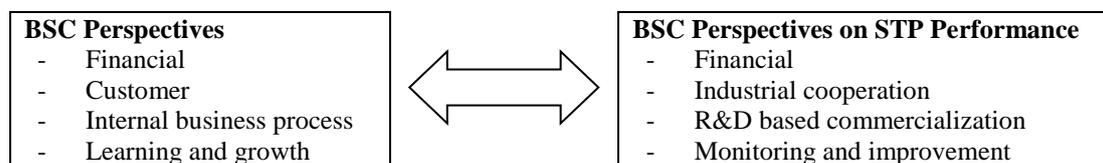


Fig. 1. The BSC Perspectives on STP Performance

Science and Technology Park (STP) as a science-based organization has the main function to bridge the technology needs of the market with the technology produced by knowledge producers (e.g. university and research institution). This function reflected in Figure 1, where BSC perspectives represented as financial, industrial cooperation, R&D based commercialization and monitoring and improvement.

Method

The case study in this article uses qualitative approach through a single case study in an STP of University in Bogor, Indonesia. The data gathered in this research can be classified as two: (i) primary data; and (ii) secondary data. The primary data collected through series of five depth interviews with the main actors of STP, including:

- Top management of STP;
- Commercialization and incubation manager of STP;
- Innovator (researcher that produce technology/innovation);
- Industrial partners (director and manager).

Interview guidance developed using the analytical framework in Figure 1. Series of depth interviews conducted in July 2016. The secondary data collected in the form of STPs report series and contract documents.

Result and Discussion

STP A is owned by the reputable university in Indonesia and established since 2014. There are four main activities in STP A regarding its function, including research commercialization, incubation of techno venture (start-up company), limited production of the R&D based product, and also training and workshop. The case study shows that STP A is the integrated unit for R&D and commercialization with core technologies of tropical agriculture, food, and bioscience. Stakeholders of STP A can be categorized as academic, business, and government. *First*, from the academic stakeholder, researcher and activities of R&D involved in STP-A, both from internal university and also external universities such as research institution and other universities. *Second*, from the business stakeholder, market involved in commercialization in STP-A, especially as a technology user, in term of investment and also as start-up companies in STP A. *Third*, the government stakeholder involved in STP A through infrastructure development, policy and legal, and also a Public-Private partnership. Moreover, activities in STP A are shown in Figure 2.

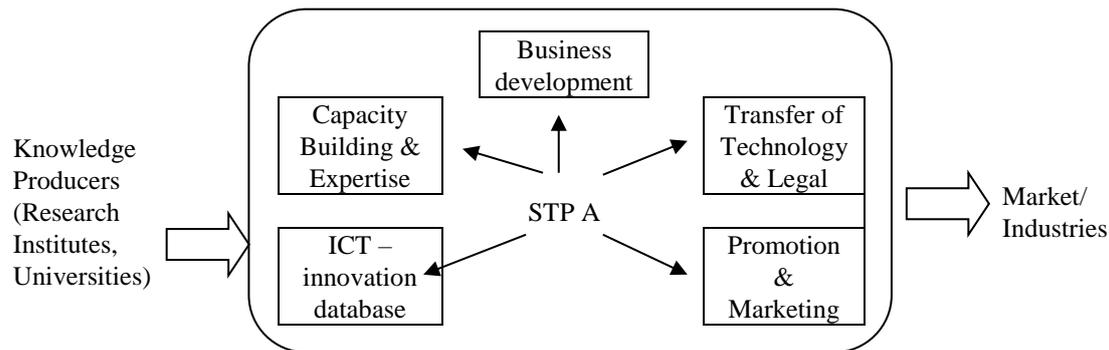


Fig. 2. Main Activities in STP A

a. Financial

STP A is owned by University A through one of its business unit x, where the entire investment in STP A comes from business unit x. On the other hand, STP-A gains innovation from knowledge producer (e.g. universities and research institute), where knowledge producer will also receive incentives related to their innovation that is commercialized in STP A. Regarding financial aspect, STP-A set up a certain scheme in order to regulate incentives both for knowledge producer and shareholder. Knowledge Producer receives royalty which the amount is already determined based on certain percentage of sales. As well as the shareholder will receive dividend annually from their investment.

The result of the case study showed that since a year after established in 2014, STP-A is already self-financing. This condition shows that financial performance of STP A is well managed. This empirical evidence also supports by secondary data from their evaluation report that in 2015, STP-A is gain profit so they can give royalty to the knowledge producers, as well as a dividend to their shareholder. However, based on the interview with the top management, STP-A still has a problem to expand their business because of limited investment. Furthermore, investment is not only limited in term of the amount but also regulation of university as STP owner. Several university regulations restrict the flexibility of STP to buy assets, especially related to the pilot project development.

b. Industrial Cooperation

STP a formal design cooperation with several firms related to commercialization activities. There were several industrial co-operations, according to the legal aspect. For a patent, the firm has the option whether want to buy a license and produce the product by themselves. The second option, for firms who not intend to produce innovation themselves, is STP A will develop a start-up company that will produce the innovation. On the other hand, STP-A cooperated not only with national industry but also with the company from another country. For example, STP-A with Shigeta Ltd., a company from Japan, established a joint venture company to produce the enzyme for livestock. Overall, STP-A relatively flexible in the aspect of industrial cooperation scheme, to accommodate what market/ industry want.

Furthermore, STP-A is also active to offering their technologies to the market through the business meeting as well as exhibition. Until 2016, there is no contract dispute regarding of industrial cooperation. However, STP-A still faced a problem in bridging the knowledge producer and industry. Some of the researchers tend to be reluctant to the feedback from the market. Whereas scale up product from laboratory scale into industrial scale must need some change or improvement. On the other hand, firms also don't want to buy the product if the feedback is not fulfilled. In this condition, the skill of negotiation both with firm and researcher is crucial.

c. R&D based Commercialization

STP A has specific and detail mechanism about the commercialization of R&D result. *Technology readiness level* (TRL) method is used in the assessment of innovation that will be commercialized. Before entering the incubation phase, STP-A conducting an independent panel assessment to determine which innovation that will be further developed. The independent panel involved academician, practitioner, and also industry. From the process of selection, independent panel usually will determine 5 selected innovations. Next step is product incubation of the innovation that will take times about one year. Product incubation started with market validation to identify how market acceptance level for the new product. Market validation will produce feedback for product improvement and product further development. Innovator involved intensively in this phase. Every phase of commercialization will be evaluated so that in some case the commercialization will not be continued if considered not perspective.

d. Monitoring and Improvement

Based on the case study, STP-A is implemented strict monitoring and evaluation scheme for product development and also as an organization. Regular meeting with internal staff and also with the industrial partner is conducted continuously. STP A also opened for any feedback both from researcher and also firms as their main stakeholder. In order to increase their staff skill, in-house training about commercialization is regularly conducted. Furthermore, STP-A also built their capacity in managerial aspect, specifically in managerial of STP.

The result of the case study above show good performance of STP A in the aspect of financial, industrial cooperation, R&D based commercialization, and also monitoring and improvement. However the case study is also found several barriers in enhancing the performance of STP A. For examples, in the financial aspect, there is still a lack of investment flexibility in terms of university regulation about investment in STP. In order to enhance STP A's performance to expand their business, certain investment regulation should be implemented to accommodate flexibility in creating a pilot project in product incubation phase. Barrier also found in the aspect of industrial cooperation, where STP A is still facing problem in bridging innovator (researcher) and firm. Involvement of both firm and researcher in incubation phase is needed.

Conclusion

Case study show evaluation of STP A in the aspect of financial, industrial cooperation, R&D based commercialization, and monitoring and improvement. Evaluation on financial aspect show good performance but still faced a problem related to the investment flexibility. For industrial cooperation, STP-A also has a good performance, although still faced a problem in bridging the knowledge producer and industry. For R&D based commercialization and improvement the case study also shows a good performance in STP A. In order to enhance STP A's performance to expand their business, certain investment regulation should be implemented to accommodate flexibility in creating a pilot project in product incubation phase. Barrier also found in the aspect of industrial cooperation, where STP A is still facing problem in bridging innovator (researcher) and firm. Involvement of both firm and researcher in incubation phase is needed.

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