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**ROLE OF STPS AS TECHNOLOGY
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STPs and AIs fostering technology-driven projects

Author:

Evelyn Azih, The Netherlands

MD/CEO-Chevelyns International B.V

Title

Role of STPs as technology development catalysts.

Revising STPs priorities: the right balance between technology and business development in
Science and Technology Parks.

A Paper Contribution

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By

Evelyn Azih- MD/CEO-Chevelyns International B.V-The Netherlands.

chevelynsconsult@hotmail.com, www.chevelynsinternational.com

Biographical notes:

Education

Evelyn Azih graduated in 2007 with a BSC in Accounting from Lagos State University as well as a Master's degree in Business Administration from Maastricht School of Management, the Netherlands. She has obtained her MPhil degree and is currently a PhD fellow with Maastricht School of Management in the area of Accounting with research focus on "Technology Incubation and Innovation of SMEs".

Personal Resume

Evelyn Azih runs a business consultancy firm in The Netherlands which is pivotal to upgrading the literacy level of Africans by assisting prospective students to get admission and scholarships

to pursue their education in Europe. Her company has contract with some universities in the Netherlands for student recruitments and organization of tailor-made programmes in the Netherlands for career development for staff of public/private Organizations from Africa.

Evelyn Azih has acquired 13 years' experience as a public servant, with Technology Incubation Centre Lagos Nigeria. She has also joined the Technology Training Committee of the Ministry of Science and Technology to liaise with government departments, employers and industry training boards on technology training matters. Her active involvement in high quality service in the public sector offers a complete spectrum of manpower strategy. She spearheads value-added services conducive to the development of SMEs via talent pool, training, consultancy, tax and business advisory services.

Abstract

This study showed some differences between the experiences of firms' on-Park and off-Park with respect to innovation, management and financial issues (Founders, Technology, management, advisers, investors and finance). The problem of obtaining finance is one of the major difficulties faced by all New Technology Based Firms. Self-financing is the dominant characteristic of funding in the small-firms sector. It is obvious that Science Parks firms have higher R&D intensity in terms of importance of R&D for a starting firm and postgraduate education. This paper aims to explore the innovation capacity a science park in the Netherlands. Considerable resources are being devoted to science parks as policy instruments aimed at promoting R&D-based as well as innovation activities. Differences in determinants for innovation capacity such as the basic research infrastructure sophisticated and demanding local customer base and the presence of clusters instead of isolated industries. It was discovered that there is more interaction occurring amongst on-park firms in the area of innovation. Without Innovation, New Technology Based Firms under Science & Technology will not move forward.

Keywords: Science & Technology Parks, New Technology Based Firms, Innovation, Entrepreneurship

Abbreviations

Meaning

STPs.....Science & Technology Parks

NTBFs.....New Technology Based Firms

1. Introduction

Science and Technology Parks are designed to stimulate the formation and development of new technology-based firms (NTBFs), and equip large Organizations with good support services especially innovation to boost their competitiveness and for regional development. They are regarded as a mechanism for generating technological spillovers and employment growth (Donald S. Siegel, Paul West head, and Mike Wright 2003). There should be a great difference between new technology-based firms under Science Parks and those outside in the area of innovation and marketing because firms located in Science Parks have the advantage of having good links with local universities, generate more employment, increased sales and profitability (Hans Löfsten^a Peter Lindelöf 2002). This is possible because local authorities, universities and public sector development agencies stimulate high technology industry and provide conditions

conducive to high technology industry (Stuart Macdonald 2007). The innovativeness of independent technology-based science park firms is ascertained through the 'added value' of a science park. (Löfsten, H., & Lindelöf, P. 2001). Hans Löfsten & Peter Lindelöf (2005) examined the Research & Development networks and product innovation patterns made by the NTBFs University spin offs, On the contrary, West head, P. (1997) argued that Science Park firms do not directly invest more in R&D than off-Park firms nor do they record significantly higher levels of technology diffusion. Vedovello, C. (1997) explores human resources links, formal and informal links that Science and Technology Parks have with Universities and the influence of geographical proximity between them. Westhead, P., & Batstone, S. (1998) perceived the benefits of a science park location in the UK for independent technology-based firms. Using "control" group of similar firms located off-park looking at the factors which influenced owner-managers to locate their ventures in a science park or an off-park location. Van Dierdonck, R., Debackere, K., & Rappa, M. A. (1991) examines the role of university science parks in fostering inter organizational technology transfers and technological development in the area of the management of technology.

This paper examines the effectiveness of STPs on the innovation of firms' on-Park and how these on-park firms grow better than off-Park businesses with respect to management and financial issues (Founders, management, advisers, investors and finance). At the core of innovation are research activities that position a firm as a learning organization. This paper also explores which services STPs could provide to efficiently support businesses in their R&D, and identify how a selection of simple processes and techniques by STPs can support technology growth and businesses development of firms under Science parks.

1.1 The objectives of the study

To identify the causes of lack of Innovation among firms under Science and technology Parks.
To identify which services STP could provide to efficiently support on-park firms.

To make recommendations on how a selection of simple processes and techniques by STPs can support the growth and development of businesses under Science parks.

1.2 Major research question

What are the roles of STPs as technology development catalysts?

Minor research questions

1. What is the right balance between technology and business development in STPs?
2. What are the services STP could provide to efficiently support larger organizations?
3. What are the causes of lack of Innovation among large organizations under Science and technology Parks?

Science and Technology Parks can help universities to become entrepreneurial organizations. It helps to build innovation through Research and Development and makes University to be successful in the area of knowledge transfer and also generate employment opportunities.

Significance to Government Agencies

Science and Technology Parks generates self-employment and high quality jobs thereby reducing the rate of unemployment in the Country. It is a vehicle for idea creation, business development and commercialization.

It contributes to the growth of the economy. Science and Technology Parks attract innovation and high technology businesses and create a brand image for the Organization and region where it is located. Science and Technology Parks are regarded as tools for community development.

Science and Technology Parks are equipped Institution of learning where every facility is provided for the entrepreneurs in other for them to concentrate only on doing business. New Start-ups without background get brand value from Science and Technology Parks. Knowledge and Network is easily accessible and shared in Science and Technology Parks. Ideas are developed and human resources are shared thereby creating a favorable business community.

This study was carried out in search of a solution to a problem observed in Science and Technology Parks, the lack of innovation among firms under STPs. There is evidence that a

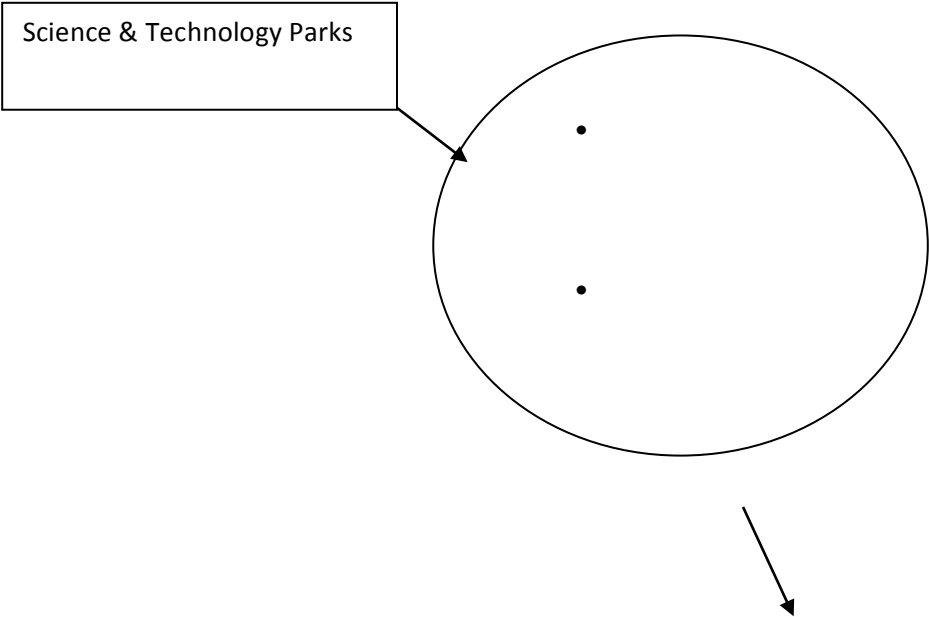
significant number of business activities under Science and Technology Parks fail within start-ups, the researcher tries to investigate the role of STPs as technology development catalysts in order to determine the causes of lack of innovation among firms under STPs.

The study is focused on Science and Technology Parks in the Netherlands. The respondents are the resident entrepreneurs from Science and Technology Parks from 2005 to 2013.

The research became necessary due to an increase of business failures and lack of innovation amongst businesses under science and technology parks. The study investigates if there are other factors that are necessary for business growth among larger Organizations which has been neglected by the Science and Technology Parks.

The study aims at investigating the Role of STPs as technology development catalysts. The findings, conclusions, and recommendations are based on the data collected from these resident entrepreneurs.

Fig. 1 Theoretical framework



Source: Author's work

1.3 Dependent Variable

Science & Technology Parks Innovative performance

To be measured with employment growth, sales growth and Net Worth.

1.4 Independent Variable

Technology transfer Program, Infrastructural facilities, and Fund raising

Independent Variables

There are three independent variables that affect the dependent variables and have to be measured specifically. They are:

Technology transfer Program

This comprises technology transfer programs in form of training and workshops, linkage with higher institutions for Research & Development, high quality human resource, monitoring and evaluation, innovation culture and strategy, technological capabilities/advancement/upgrading, and networking. Technology transfer programmes should also feature opportunity for shared knowledge among firms. Through shared knowledge relationships, entrepreneurs can adapt resources and combine competences, thereby increasing their value. This enables adaptation of resources in such a way that they mutually reflect in one another (Hakansson, Hakan &

Waluszewski, Alexandra & Ebooks Corporation). Up-to-date technological skills through oversea training for technological advancement and upgrading. Firms under STPs should be willing to adopt and modify an already existing technology that is new to their business and tap into global technology. There is bound to be productivity in business through more efficient services and manufacturing processes, opening up new markets, investing in problem-solving to meet customers' needs, collaboration with customers, suppliers, and competitors.

Infrastructural Facilities

The infrastructural facilities in Science & Technology Parks include Warehouse for storage of raw materials and finished goods, library/secretarial Services, laboratories for product analysis, and quality control, conference room, and parking space.

NTBFs under STPs are more innovative if they are provided with modern infrastructure and support services.

Fund raising

This includes access to social media, advertising & promotions, marketing, collaboration, benchmarking, linkage with big market avenues, Synergy among units and reduced Operating costs through shared facilities, access to funding (seed capital), linkage with financial institutions for loan or other financial related matters, linkage to suppliers of high quality raw materials.

2. Other literatures

Westhead, P., & Batstone, S. (1998) explores the perceived benefits of a science park.

The property needs of independent science parks firms were compared with the property needs of a 'control' group of similar firms located off-park and the factors of influence determined.

Löfsten, H., & Lindelöf, P.(2001) reiterated that Science parks provide an important resource network for new. John Phillimore S&T Parks is concerned with the established links between industry and university, and the expectation that science parks will strengthen their linkages.

Bakouros, Y. L., Mardas, D. C., & Varsakelis, N. C. (2002) discovered through their research that businesses under science parks grow more than the off-park firms when measured in terms of sales and jobs.

Fukugawa, N. (2006) investigates the value-added contributions of science parks to new technology-based firms (NTBFs) and found out that on-park NTBFs exhibit a higher propensity to engage in joint research with research institutes. Bigliardi, B., Dormio, A. I., Nosella, A., & Petroni, G. (2006) measured the performance of science parks on the innovation of SMEs and calls for more rigorous approaches to support Science and Technology Parks.

2.1 Analysis

This paper aims to explore the innovation capacity of a science park in the Netherlands. Considerable resources are being devoted to science parks as policy instruments aimed at promoting R&D-based as well as innovation activities. Phillimore, J. (1999) finds that there is more interaction occurring than might be estimated using the traditional evaluative model and identifies several different categories of company which exist at the Park, in terms of their interactive behavior. Most of these studies were focused on the number of new firms, jobs, and firm survival without relating it NTBF's innovation. Without Innovation, firms' growth is retarded. STPs are expected to improve the Innovation/technological capabilities of NTBFs thereby adding great value to the economy.

2.2 Knowledge Gap

This paper will address the problem of lack of innovation and technology capabilities among on-park firms. The result will help STPs to design models and inculcate innovation culture and strategy that will help NTBFs to become more innovative.

3. Methodology

This research employs the use of quantitative data collection and analysis technique. Questionnaire was used to collect data from STP resident businesses in the Netherlands from 2005 to 2013. It was used as research instrument to collect primary data to trace how the support services rendered in Science Technology Parks are claimed to lead to technology development and eventually to improved business performance. Descriptive statistics was used to present and analyze the innovative performance of the support services used as independent variables.

Three variables were tested, (Technology transfer Program, infrastructure and other facilities, and fund raising. Regression analysis will be employed to identify the correlation.

4. Findings

Looking critically at the number of employees of on-park firms had as per the time of data collection as to compare to the number of employees of off-park firms, it can be observed that on-park firms have more number of employees than off-park firms. Measuring the innovative performance of firms with number of employees suggest that Science 7 Technology parks have a positive effect on the new technology based firms (NTBFs).

Most on-park New Technology Based Firms have over 100% changes in sales. This shows that Science & Technology Parks have positive innovative performance on NTBFs.

Using Net Worth to measure the innovative Performance of STPs shows that Science & Technology Parks has a positive correlation with the innovative performance of on-park firms.

Technology Transfer Program is measured by the quality of human resource, effective backup of senior with less experienced staff, effective training/support programme, training quality, and training in industrial trade, shared knowledge, and monitoring of Prototype of machines. Technology transfer programme has relationship with the innovative performance of STPs.

Infrastructure and other facilities is measured by the availability of large premises, well structured factory Unit, packing store, free accommodation, conference center, work stations, laboratory, library, secretarial service center, training room, first aid room, product display center, good security system, car park, constant power supply, availability of alternative power supply, facility maintenance unit. From

the analysis carried out shows that Science and Technology Parks provide space and other facilities necessary for a successful innovation.

Fund raising is the financial assistance given to firms for their business. It can be in the form of soft loan, loan with low interest rates, Loan with longer repayment period, sourcing of machineries and raw materials. Regression analysis test shows that fund raising's characteristics such as loan, sourcing of machineries, minimal interest rate and longer repayment period is seen to be effective in the innovative performance of Science & Technology Parks.

The findings of the study suggest that the support services in Science and Technology Parks are Technology transfer Program, infrastructure and other facilities, and fund raising. In determining the innovative Performance of Science and Technology Parks, data was collected through questionnaire. The respondents comprised 40 on-park NTBFs and 40 off-park NTBFs from 2005 to 2013. Of the forty, thirty six were male, while four were female. This difference could be attributed to the lack of participation of women in business. The percentage agreement is high, therefore fund raising's characteristics such as loan, sourcing of machineries, minimal interest rate and longer repayment period is seen to be present and therefore is effective in the innovative performance of Science &Technology Parks.

5. Conclusion

From the analysis, measuring the innovative performance of Science & Technology Parks on new technology based firms (NTBFs) with significant increase in some performance indicators like the number of employees, sales turn over, and Net Worth suggest that STPs has a positive effect on the innovative performance of NTBFs.

All the variables showed positive result which means that the STPs play a vital role as technology development catalysts. The first objective of the study which is to identify the causes of lack of Innovation among firms under Science and technology Parks has been achieved with the independent variables(Technology Transfer Program, infrastructural facilities, and Funding) showing positive correlation. The second objective which is to identify which services STP could provide to efficiently support on-park firms has also been achieved with Technology Transfer Program, Physical Space & Other facilities, and fund raising being strongly effective in the innovative performance.

From the research, it can be concluded that Science and technology Parks play a vital role in the innovative performance of On-Park firms and this can only be achieved through proper supervision and implementation of best practices.

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