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The Ecosystem for Niche Technology Innovation

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Abstract

This paper describes the Ecosystem for Niche Technology Innovation (ENTI). The ENTI has been optimized for innovation of global technologies in regions with limited resources and lack of world-class technologies. Therefore, the ENTI has been devised for economically less advanced regions where existing core competency and critical mass of technology are insufficient to support global technologies. This comprehensive, three-stage ecosystem has been devised for discovering and creating effective technology niches, or simply, finding successful product solutions within technology niches as well as bringing niche products to the global market. ENTI has a potential to create unique cluster structures emulating new niches based on both competency and technology synergies.

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Keywords: innovation; core competency; critical mass of technology; niche; synergy; SME

1. Introduction

About 15 years ago, Prof. Pawlak laid the foundation for the Ecosystem for Niche Technology Innovation (ENTI), a unique ecosystem for discovering effective technology niches. It began from his recognition of the importance of both the paradigms of technology and innovation in the new millennium [1]. At that time, a set of novel innovation tools and techniques were devised, which helped in development and ranking the world's first global technology portfolio [2–7]. Prof. Pawlak's application of these tools and techniques enabled the efficient evaluation of hundreds technologies annually, over 10 years. The evaluation covered a wide range of technologies, from satellite to medical, within U.S. global companies. This long-term practical experience with U.S. global companies proved the effectiveness of niche innovation tools and techniques that features unique approach, quite different in comparison

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with open innovation [8] or leading corporate innovation techniques [9]. In addition to the U.S., Prof. Pawlak also effectively applied these tools and techniques in Poland. In November 2009, he developed the world's first regional map of knowledge. The groundbreaking map was of the Malopolska, Poland [10]. The map was based on data from thousands of scientific studies and research papers, published at the three key universities in Cracow, Poland. In January 2010, a pioneering workshop was conducted at the Katowice Euro-Center Science Park, which introduced and emphasized the importance of the development of unique, Niche Innovation Method (NIM), [11].

Prof. Pawlak's collaboration with the Wroclaw Research Center helped the development of a comprehensive approach of discovering technology niches for the Lower Silesian region [12]. This three-year experience enabled him to further develop his unique innovation method. The complexity of the ENTI approach, which originally only consisted of the NIM component, has grown with the addition of two complementary elements: the Niche Technology Enhancement (NTE) and the Niche Startup Fund (NSF). It is now evident, that similar, growing economies could adopt this ENTI ecosystem. The ENTI is capable of exploring the NIM tools, with additional R&D niche enhancements, while providing self-funding for the commercialization of niche startups. The subject of this publication is this comprehensive ecosystem, which enables the exploration of niches and is intended to support small and medium enterprises (SMEs).

2. The Ecosystem for Niche Technology Innovation

The ENTI is a three-stage, continuous ecosystem that focuses on the discovery of technology niches and enables the commercialization of niche products. Stage I is the Niche Innovation Method (NIM). Stage II is the Niche Technology Enhancement (NTE). Finally, Stage III is the Niche Startup Fund (NSF). This ecosystem features a continuous cycle that is designed to be self-sustaining. Stage I involves implementing the NIM, which is made up of several tools and procedures, in order to find gaps in technology and lead to the discovery of niche solutions or products. Once the niche solutions are discovered in Stage I, Stage II begins with a focus on elevating the technology and/or core competency of that solution up to a globally competitive level. Bringing the solution to that level allows for it to be ready for commercialization. The last part of the ecosystem, Stage III, focuses on bringing the product to market (commercialization). The Niche Startup Fund is designed to focus solely on funding startups that have successfully completed Stage II, i.e. ensuring that they commercialize their niche solutions. The Fund has a continuous and cyclical investment intent, which means that once the Fund seeds a startup, after commercialization and profitability (as defined in the agreement), the startup will then allocate a percentage of the profits to the fund. That allocation of resources can be used for funding another startup, which has also successfully completed Stage II, or potentially, the original startup's future niche solutions, hence, making this a continuous, self-funding model, similar in spirit to that of Silicon Valley.

2.1. Niche Innovation Method

The Stage I of the ENTI consists of the NIM, with four sophisticated, robust, and industry-proven tools and procedures. These four tools play a critical role during the niche innovation process. The tools of the NIM include:

- Virtual Mapping: a technology tool that is used to create technology maps, resource maps, and competency maps
- Niche Discovery: a tool used to find a niche by identifying technology gaps and unmet market needs
- Solution Matrix: a tool used for finding all the possible potential technology solutions (products) within the niche
- Technology Valuation: a tool used for the valuation of technology based on technical merit, business, and financing components from the perspective of commercialization.

2.1.1. Virtual Mapping

The first tool of the NIM is the Virtual Mapping. It is a tool that is used to create technology maps, resource maps, and competency maps. Virtual maps are essentially visual depictions of text documents. These depictions are similar to geographical maps. Generally, the mountain peaks or hills represent a high number of data documents, while the valleys or waters represent a low number of documents. The input documents for creating such virtual maps are any