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Book Review

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F. Therin, ed. (2013) *Handbook of Research on Techno-Entrepreneurship - How Technology and Entrepreneurship are Shaping the Development of Industries and Companies*, Edward Elgar, London

This Handbook represents a collection of works and contributions by researchers who approach techno-entrepreneurship, also referred to as 'technological entrepreneurship', 'technology-based entrepreneurship' or 'techno-preneurship', from diverse perspectives. It comprises 18 chapters written by 36 international contributors from 16 different countries. The economic crises that has in the past years severely hit many countries causing massive loss of jobs, decrease in productivity, raising unemployment and decreasing competitiveness, has shown that only by adopting the strategy of technological re-engineering and revitalization can these countries return to the path of economic recovery and prosperity. Developing viable technology-based businesses has emerged as the strategy for future development of the underdeveloped as well as the developed nations. "Having strong high-tech industries is important for emerging and transition countries as they often lack businesses offering added value and being potential exporters outside of the service sector." The developed countries are confronted with mature industries where re-engineering and new technology are necessary for their revitalization.

The interest of researchers in the field of techno-entrepreneurship has grown in the past ten years and, as it is emphasized, has diffused into different fields of management covering an array of research topics, such as academic entrepreneurship, frugal innovation, green and sustainable techno-entrepreneurship, family business, techno-intrapreneurship, e-entrepreneurship, commercialization process of innovation, and many others.

Techno-entrepreneurship is broadly defined "as the entrepreneurial and intrapreneurial activities of both existing and nascent companies operating in technology-intensive environments." In this edition we come across multiple definitions that shed light on the phenomenon from different angles. The definitions range from simple statements that emphasize the commercialization role of techno-entrepreneurship (TE) bringing emerging technological discoveries and innovation to the market to those that define TE as a style of business leadership that "involves identifying high potential and technology-intensive commercial opportunities, managing rapid growth and significant risk, gathering resources such as talent and capital, including principled decision-making skills." Special attention is paid to the role of TE in the established field of entrepreneurship at universities and research institutions. Some researchers focus on the opportunity aspects analyzing the process of building organizational capacities based on resources and technological systems that capture value through exploration and exploitation of technological innovation.

Alternatives of organizational implementation that the technology entrepreneur can choose from are systematized according to criteria such as legal status and ownership. External, legally independent but company owned options are related to spin-outs that are realized through different arrangements. Internal, legally dependent solutions based on company's ownership are identified as intrapreneuring and also represented by a detailed analysis of intrapreneurship, corporate venturing and venture management. External, foreign property solutions are represented by start-up share involving corporate venture capital, venture nurturing and new-style venture considerations. Spin-in is an option for foreign property and internal, legally dependent organization that is analyzed through integration/consolidation and merger/acquisition strategies.

As related to the new roles of universities and science research institutions, Diane Isabelle, in the chapter "Capitalization of science and technology knowledge: practices, trends and impacts on techno-entrepreneurship", has cited a taxonomy of public research spin-off ventures in the following way: direct research

spin-offs, as new ventures created to commercialize intellectual property (IP) arising out of research institution; technology transfer companies, as companies set up to exploit commercially the university's tacit knowledge and know-how; start-ups or indirect spin-off companies, as companies set up by former or present university staff/students with no formal IP licensing or similar relationships to the university, and spin-ins, as new ventures derived from the licensing or other agreed exploitation of new knowledge generated by public research agencies.

Other researchers have contributed to the concept of new technology-based firms by stating their different modes of activity: consultancy and R&D contracting, product oriented modes, and technology asset oriented mode.

New research results have shown rising trends of partnership and collaborative modes in, once very separate, worlds of university, industry and government. This convergence was presented by Etzkowitz and Leydersdorff in 1995, through the Triple Helix Model. In this model it is emphasized that knowledge and technology are co-developed, rather than transferred. A new concept is emerging called science entrepreneurship and means a simultaneous dedication of a scientist to both the academic science and the commercial profit. Some of the differences between countries can be recognized; while in the US this phenomenon is well established, it is relatively new in Germany and Japan "due to stronger compartmentalization between academia and industry". The example of Cambridge University is an interesting case for the history of entrepreneurial activities dated back to 1881 when the Cambridge Scientific Instruments Company was founded. It has become a tradition at Cambridge University and in the last few decades companies rooted in the university have been rising. It is stated that this phenomenon today shows that nearly 20 percent of firms have a university as a founder. As related to spatial concentration, incubators, science parks, centers of excellence, clusters, public-private partnerships and public procurement are explained.

The commercialization process in small technology firms is dependent on both internal activities and external support services, as Jarkko Pellika concludes in his theoretical research.

Another interesting new concept developed in this Handbook is the frugal innovation defined as "business model characterized by the use of limited resources to create low cost products – from \$35 tablet computers to \$3000 cars – that are sustainable for the environment and individual communities". Preeta Banerjee and Ana Leirner have stated in their research that frugal innovation begins in developing countries by asking the question: how can we do more with less while serving the basic needs of the Bottom of Pyramid population? The authors emphasize that in answering this question the innovations brought forward are often good quality, functional products that are reasonably priced even to customers of modest means.

Sustainable technology entrepreneurship is concluded to be of high potential for future research and effective use in the concrete situations in practice. The challenging new ideas, theoretical and multilevel frameworks, should further be investigated for the purpose of understanding sustainability and enabling technological entrepreneurs to play a key role in moving towards a sustainable society.

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