

New Technology-based Firms in the New Millennium - IX

JOURNAL OF STRATEGY &
PERFORMANCE MANAGEMENT

July 2014. Volume 2, Issue 3, 122-127.

Article Type: Book Review.

Citation: Kureshi, N. (2014, July 1). [Review of the book New Technology-based Firms in the New Millennium, by Aard Groen, Ray Oakey, Peter Van Der Sijde and Gary Cook (Ed)]. *Journal of Strategy and Performance Management*, 2(3), 122-127.

Aard Groen, Ray Oakey, Peter Van Der Sijde and Gary Cook (Ed). Emerald Group Publishing Limited, West Yorkshire, UK. ISBN: 978-1-78052-118-3, ISSN: 1876-0228 (Series)

Book Review

Technology-based start-ups continue to play a significant role in growth of economies world-wide. Globally, technology based start-ups outnumber the non-tech start-ups, mainly due the pervasive focus of developed and developing economies on knowledge based companies (Astebro & Bernhardt, 2003). Technology-based start-ups present valuable indicators of technological performance in many ways since they are not only a major source of innovation transferring knowledge into the economy (Audretsch, Santarelli, & Vivarelli, 1999) but also inspire competition in the market through different diffusion channels (Rogers, 2003) , thus having a multiplier effect. Through their innovations and inventions, they also play their part in creating future new industries.

The book under review is an edited book consisting of 12 chapters in addition to the introduction, all drawn from the best papers presented at the annual International High Technology Small Firms (HTSFs) conference held at Enschede, The Netherland. The book starts with Introduction by two of the editors. This book is the ninth volume in a series of new millennium volumes from this conference, which started in 1993.

The main focus of this volume is “engaged scholarship”, a concept propounded by Andrew (2007). As evident from the name, engaged scholarship is “... a participatory form of research for obtaining different perspectives of key stakeholders...” (p. 9). The 12 chapters are grouped under three themes of *Entrepreneur Education*, *Enterprise Internationalization* and *Strategies for Innovation and Growth*. Following paragraphs provide a review of each chapter in order.

The first chapter after introduction, titled “*Enterprise Education and the Adoption of New Technologies Within Small Firms*” by Thompson, Kwong and Jones Evans explores the causal relationship between participation in enterprise education and propensity of entrepreneurs to adopt newer technologies in their businesses. The paper has used UK specific data from the 2005-2007 surveys conducted by Global Entrepreneurship Monitor (GEM) UK, a project providing comparable data about a number of countries on entrepreneurial activities and attitudes. While enterprise education remains an abstract term (Ulla & O’Gorman; 2004), the authors have established a relationship between entrepreneurship education and innovation through extensive literature review. The research analyzes four sources of enterprise education including *school based enterprise education*, *university based enterprise education*, *formal work placements* and *government training*. Based on the empirical analysis of data, the authors have concluded that school based enterprise education and formal work placements have no impact on increasing the probability of early technology adoption. Significantly, this study also concludes that

even university based enterprise education has no significant impact on it. The only source that impacted the probability of early technology adoption was the government training schemes. Since the data was only from UK, the authors have indicated that the results may not be generalized. Another limitation was the broadness of categories of enterprise education thus not differentiating between students of engineering, business or other faculties taking entrepreneurship related courses.

The next Chapter is by McGowan and Cooper titled “*Taking Technological Opportunities to the Market: The role of University-Based Business Plan Competitions in Supporting High technology Commercialization*”. Almost all quality universities around the world use business plan competitions or similar initiatives to stimulate entrepreneurship and innovation in their students, recent graduates and university staff. There are many anecdotal references about successful organizations having their roots in entrepreneurial activities of students in engineering, management or engineering-management schools. However, little research is available to establish a relationship between such initiatives in universities and entrepreneurial activities (McGowan & Cooper, 2008). The chapter under review attempts to fill this knowledge gap by studying the role of such initiatives from two universities in Northern Ireland by focusing on entrants of the £25k Enterprise Award Scheme business planning competition held in 2007. After explaining the process of competition, the authors have analyzed the business plans of top ten teams. Some of the driving factors behind successful plans indicated by the research are; key knowledgeable individuals in the teams aware of the ripe opportunity for business, professional experience in the team and network of personal contacts inter alia. The authors argue that most of these teams would not have started entrepreneurship if the forum of these competitions were not available. Lastly, an important finding of this research is that all of the winner plans came from Science, Engineering, Technology or Creative Media faculties and none from Business or Management faculties; bringing into right the traditional role of Business or Management faculties as the “homes of entrepreneurship”.

Chapter 4 is a research by Klofsten and Oberg explores differences between Coaching and Mentoring. The authors have attempted to demystify the general intertwining of the two unconventional areas of Entrepreneurship education. The study used 21 items with four constructs to distinguish between coaching and mentoring; including *structural issues* (mission, form, tasks), *process issues* (connection to program content, meeting environment, problem solving, assessing the opportunity/idea, operative role, confidentiality and networking), *relationship* (extent, meeting initiative, homework, documentation and follow-up) and *character of the coach or mentor* (background, engagement, integrity, social skills and ethics). The results indicate that there are structural differences between coaching and mentoring, related to mission, form and task. Similarly there are process related and relationship related differences. There are some process related similarities including ideas assessment, meeting environment, operative role and confidentiality. Similarly almost all of the items under character of the coach or mentor are similar save background and experience which shows that a coach is a generalist while a mentor is often a specialist.

Some HTSFs, generally referred to as Born Global or Global Start-up firms, go global immediately after formation, sometimes even before they have started trading. Chapter 5, the first chapter under the theme of Enterprise Internationalization is titled “*Clustering and the Internationalization of High technology Small Firms in Film and Television*” by Cook and Pandit. The research explores the relationship between clusters, entrepreneurship and internationalization of a business through extensive literature review and empirical research on UK’s 2003 Annual Survey of International Trade in Film and Television Services (FTV) which examines sources of export and import revenues by country. The research uses two models; a restricted logistic regression model and a full model. The restricted model estimates the probability of international activity (export/import) through independent variables of

overseas ownership of firm, age of firm, classification for local operations, location of the firm (indicating extent of clustering in the region) and *total employment*. The full model adds in *productivity, advertising/sales, R&D/sales, mean wage* and *investment intensity*. The results of research indicate that strong clusters promote higher rates of start-up survival and business growth and the clusters and new firms seem to reinforce each other. The results also show that both export and import activities are more likely in strong clusters. Internationalization of start-ups seems to be linked to the characteristics of industry which it belongs to. Finally, the research has found little support for the proposition that internationalized firms or those acquired by overseas multinational enterprises will become less embedded in the clusters.

Resource scarcity is an inherent constraint that all new SMEs face. This challenge is multifold for Born Global Firms since the phenomenon of internationalization has its own, seemingly significant, hunger for resources. Chapter 6 is titled “*Strategies for Circumventing Born Global Firms’ Resource Scarcity Dilemma*” by Sasi and Arenius. The research analyzes 10 case studies of Finnish Born Global Firms (Oviatt & McDougall, 1997) of the Information and Communication Technology (ICT) sector for the strategies they used to internationalize without incurring high costs for it. 5 of the 10 case firms internationalized from day one of their business while all other internationalized within 6 years of start. The authors, through literature review, have identified three broad strategies which SMEs use to tackle the resource scarcity challenge including *externalization strategy, low resource consuming foreign entry mode strategy* and *internet strategy*. The results indicate that reputation building is critical for newly internationalizing ventures to overcome the liability of newness (Stinchcombe, 1965) and the liability of foreignness (Zaheer, 1995). While all three broad strategies were important to the case firms, they seemed to use hybrid, resource economical strategies in the developmental stage, even when subsidiaries were established abroad. The firms focused their energies on key markets, serving them through internet. The authors have finally suggested that if both home and target markets are at equal level of technological development, BGs are more likely to succeed in their internationalization efforts.

In Chapter 7, Gruber-Muecke examines the relationship between competencies of entrepreneurs and the internationalization process. The author argues that internationalization entails high risks (Mudambi & Zahra, 2007) and failure potential, therefore there is a need to better understand internationalization competencies. Based on a survey of 803 new startups in Upper Austria, the author analyzed internationalization in its complex form. From the resource based perspective, the results indicate that internationalization of a small startup business is positively related to *home-based social networks, resources from strategic partners* and *resources from social networks*. Similarly from the competency based perspective, the results indicate that internationalization process of such firms is positively related to *network, technology* and *management* competencies of the small business owner.

Strategic management of any organization is critical to its sustainability. A well founded strategy is based on a robust analysis of the environment in which the firm has to operate. The third and last theme of this book starts with Karami’s research on environmental scanning and growth strategy in high-tech SMEs. The author conducted a mail survey of 132 CEOs of SMEs in British electronics manufacturing industry. The respondent firms were divided into three categories of *high-performers, moderate-performers* and *low performers*. The results indicate that environmental scanning is significantly related to performance level. Responses indicate that CEOs consider technological changes as their top priority in environmental analysis followed by competitors, economic trends, social & cultural trends and lastly political and legal environment. The research also investigated respondent CEOs’ perception of the ranked importance of Porter’s 5 Forces. The results indicate that respondent CEOs ranked *bargaining power of buyers* as the most important factor followed by *rivalry among firms, substitutes’ threat, new entrants’ threat* and lastly *bargaining power of suppliers*. The author advises a customized adoption of

environmental scanning by SMEs instead of a 'blind adoption' of models followed by large firms. Perhaps the most important, albeit obvious, argument by the author is that if the entrepreneur exhibits a lack of strategic awareness, no strategic planning can take place.

In Chapter 9 titled "*Transitional Governance in External Technology Sourcing Trajectories: Connecting Pre-Acquisition Collaboration to Post-Acquisition Integration*", Faems explores how the pre-acquisition collaboration influences the post-acquisition integration. The chapter analyzes four external technology sourcing trajectories from the advanced materials industry. The research followed three distinctive stages. In the first stage interviews were conducted from two sources from each trajectory, which formed the basis of graphical chronology of major events in the trajectory. In the second stage, structured interviews were conducted with 32 managers and engineers from the case firms which formed the bases of writing 4 case studies, one for each trajectory. The third stage used an inductive approach coupling within-case analysis with between-case analysis (Eisenhardt, 1989; Yin, 1984) to answer the research questions. Based on results, the author has proposed that in presence of uncertainty about the entrepreneurial firm, acquisition is likely to be preceded by a collaboration stage. Similarly, pre-acquisition integration supports post-integration integration. Finally, if the level of pre-acquisition collaboration is low, the probability of substantial management changes in the entrepreneurial firm is higher.

Patent management related practices of any business are a reflection of its strategic management practices. In Chapter 10, Kern and Van Reekum present a typology for assessing strategic patent management maturity in Dutch biopharmaceutical SMEs. Based on Ackoff (1981), the typology categorizes patent management practices by firms in four broad categories; *Inactive, Reactive, Active* and *Proactive*. After defining each category, the authors look at patent functions from a managerial perspective, dividing the 12 functions into three categories of *Inherent, Utility* and *Attributed*; with four functions each. A pilot study of three biotechnology firms was conducted to improve the operationalization of the conceptual framework. The authors then applied the resultant typology to 16 small sized therapeutics/biopharmaceutical firms in Netherlands to prove the concept. The results indicate that majority of sampled firms exhibited an inactive attitude towards patents as an incentive, since they had no reward mechanism in their organizations for patenting. Similarly, most respondents were inactive in protection of their patents. Except two respondents, all were either inactive or reactive in valuation of their patents. Majority of the sampled firms were proactive in use of patent related information. Overall, the results of the case study of 16 firms are fairly mixed and do not allow for generalizations.

Strategy making is generally associated with large established firms. In chapter 11 Lim, Platts and Minshall present an exploratory study of manufacturing strategy in start-up companies which design, produce and market physical products. This chapter includes an extensive literature review of manufacturing objectives and strategic decision areas. The research is based on 46 interview of founders and/or founding team members of 6 independent UK manufacturing start-ups in different industries based in Eastern and Central England. The study also used strategy charts as a major data collection tool. Analysis was supplemented by other sources such as documents, records, company visits, artifacts, events etc. Multiple data sources allowed for triangulation thus minimization of response biases (Yin, 2003). The result is a novel framework of different strategy related objectives and activities of firms over 4 different stages of development, i.e. *initial idea stage, product development and market development stage, selling stage* and *profitable stage*. The stages are differentiated by achievement of defined milestones by the companies. Manufacturing activities are also categorized in 3 major groups of *designing and developing products, producing products* and *delivering products including providing support and services*. Based on the practices of companies

under study, the chapter also proposes two business orientation mobility models; one being from *market-pull to technology-push* and other from *technology-push to market-pull*.

Chapter 12, by Laine, explores innovation management in two Finnish technology based Knowledge Intensive Business Service (KIBS) firms. Through literature review, the chapter has categorized innovations as *disruptive, open, systemic, incremental* and *radical*. The research has then identified 36 tools, methods and processes being used by the case firms for innovation management, with many common elements also found in the literature (Van de Ven, Polley, Garud, & Venkateram, 2008). Benefits of each of the tools, methods and processes are also outlined. Based on the two cases studies and presented theories, the authors have suggested a 10 step interactive and iterative innovation process for growth in a small KIBS firm. The authors have finally suggested following a systemic approach to the innovation process and combining the tools, methods and processes from disruptive, open, systemic, incremental and radical innovations.

Finally, Kraaijenbrink, in Chapter 13, presents an appreciation and critical reflection on Sarasvathy's work on the causation and effectuation models of entrepreneurship. The author has reviewed and built upon 11 published works by Sarasvathy (books, journal and conference papers; some with co-authors) and 3 unpublished manuscripts available on her website; www.effectuation.com. The author has outlined 6 dimensions that emerge from comparison of causation and effectuation models including *starting point* (ends or means driven), *assumption on future* (control vs. prediction), *predisposition towards risk* (affordable loss vs. expected returns), *appropriate for* existing or new products markets, *attitude towards outside firms* (cooperation or competition) and *type of model* (linear or cyclical). The author argues that these 6 dimensions are independent of each other and therefore the distinction between causation and effectuation is an over simplification. Further, building upon Parsons' functionalist theory of action (Parsons, 1937, 1951) and Joas' theory of creative action (Joas, 1997), the author has argued that pragmatism should be used to understand underlying human actions leading to causation and effectuation instead of distinguishing between these two alternate models.

Overall, this book presents a good collection of contemporary researches on technology based firms in the areas of entrepreneurship education, enterprise internationalization and strategies for innovation and growth in technology based startups. It includes researches based on theories and empirical evidence and the quality of research varies significantly across papers. Besides presenting original works in the above areas, some papers offer high quality literature review as well. Cover to cover, this book offers interesting reading and is recommended for researchers interested in an introductory body of knowledge on high technology startup firms in Europe and UK.

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