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Strategies for service and market development of entrepreneurial software designing firms

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Abstract

Based on a review of the literature of new technology-based firms, this study developed a strategic management framework for service and market development of entrepreneurial software firms (ESFs) by integrating business with technology strategies. Testing the strategic management framework in a pilot sample in Malaysia showed that vulnerability, market uncertainty, rapid technological change and development, and lack of resources, especially human resources, were constraining the growth and development of these software firms. The study found that for their product development, the Malaysian ESFs lacked a clear strategic focus on developing technological superiority, and accessing multiple sources of technology. Strategies critical for software market development that need to be improved were the speed to market entry, linkage with large customers, and development of appropriate distribution channels. Long term policy, top management commitment, responsiveness to change, and creation of an innovation accepting, entrepreneurship accommodating culture were found to be important facilitators for innovating new software. © 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Technology-based entrepreneurship; Business strategy; Technology strategy; Technological capability; Software development

1. Introduction

A literature survey on small firms and innovation in the UK revealed substantial gaps in our knowledge about innovation within SMEs. In particular, the evidence is inconsistent on how such firms develop strategy and incorporate innovation into their thinking on this, how they mobilize and access resources and how they monitor and control their disposition in innovative projects (Hoffman et al., 1998).

Changes in the operating environment of entrepreneurial technology-based firms occur increasingly more often because of rapid technological change, and globalization of their markets. Growing competition requires the ability to adapt, to change and to find new ways of meeting those challenges. Strategic assessment of the nature and direction of change and the build-up of innovation competence to manage the response to turbulent and shifting environments requires the firm to

craft an explicit technology strategy that is systematically integrated with its business strategy (Lee and Ro, 1996; Bessant et al., 1998).

Adaptive and creative renewal of products, services and the processes to produce and deliver them forces management to make those strategies explicit that have to be adjusted frequently for survival and growth (Slatter, 1992; Hill and Jones, 1995; Rogers and Larsen, 1995; Berry, 1996; Baruch, 1997; Tidd et al., 1997). The portfolio of strategies for implementation include scanning, deploying strategic goals, customer orientation, supplier linkages, technology access, building networks at the different levels to support a focused and continuous development of products and markets (Bessant et al., 1998).

Managing the tensions that emerge from the misfit between technological resources and strategic choices is one of the most serious challenges for management in small high-tech firms (Berry, 1998). Utilizing resources effectively and reconfiguring them to strengthen their competence to innovate is the only way for small high-tech firms to sustain their competitiveness (Porter, 1997; Teece and Pisano, 1994). Moreover, if the business is

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fragile in nature due to its entrepreneurial and high-tech characteristics, as is the case with small software designing firms, their capability for strategically directing innovative responses on a continuing basis is even more critical. Studies have shown that 65–80% of small high-tech firms drop out before maturity because of vulnerability due to a rapid rate of technological change, market volatility and uncertainty, competition, employee characteristics, resource constraints, or the entrepreneurial founding team (Slatter, 1992).

Having limited resources while facing rapid technological change and short product cycles, entrepreneurial software firms rely mainly on their technological knowledge. Most critical are their capabilities to assess the nature and direction of the change required, and their competence for successful implementation. Their efforts, both, in service and market innovation, must be guided by an underlying strategic rationale.

Based on the review of literature on strategic management of entrepreneurial technology-based firms, this study developed a strategic management framework for service and market development in entrepreneurial software designing firms.

2. A strategic framework for managing new product and market development

This study looked into survival and growth strategies of entrepreneurial high-tech companies, that are also known as high-technology small firms (Oakey, 1993; Roberts, 1991) or new, technology-based firms (Autio and Yli-Renko, 1998). Such firms are technology-based because they exploit advanced technological knowledge developed in-house or acquired from external sources to create new technical solutions, and they are entrepreneurial because they are managed by the individual or a group of owner(s) (Autio, 1997; Slatter, 1992). Thus their technological resources and capabilities are most critical for their product/service and market development. In order to survive they must build the competence to continuously adapt and create new products and develop the processes to produce and deliver them to the customer. The firm's competence to build and reconfigure technological resources and capabilities effectively is the most valuable asset of entrepreneurial software companies. Strategic options for developing new software products include orientation to customer needs, emphasis on strong technical superiority, continuing involvement of the entrepreneur, and focusing scarce resources. The market development for new software must be supported by gaining and maintaining credibility, building market differentiation, linking with large customers, developing distribution and selling, managing the marketing efforts, and speed to market entry (Slatter, 1992).

The strategic management framework for product/service¹ and market development proposed to these entrepreneurial software firms (ESFs) separates the strategy management process into two parts, a strategy formulation stage and an implementation stage.

2.1. *Crafting the new product strategy formulation*

The strategy formulation process clarifies the firm's business goals and strategies (i.e. new and customized software development, speed to market, strong technological superiority, and market differentiation) and related technology strategies to achieve these goals for its different software products.

Technology and business strategy are continuously linked in a dynamic and dyadic² relationship that can improve the firm's operational flexibility, responsiveness to customer needs, and innovativeness (Zahra et al., 1999). This continuous, two-way process can result in a new business definition and competitive approach as the firm changes its emphasis on technology and competitive strategy variables over time.

Studies by Miles and Snow (1978), Peters and Waterman (1982), Freeman (1982), Quinn et al. (1988), Twiss and Goodridge (1989), Prahalad and Hamel (1990), Boden (1994), Hampson and Tatum (1997) and Sharif (1994) have proposed a number of business strategy typologies that link technology strategy and structure. The technology strategy typology introduced by Sharif (1994, 1995) and applied in this study bears the greatest similarity with the work of Miles and Snow (1978). Both typologies rely on a theory that links the strategic intent, competitive and technology variables, and structure of the firm.

According to Sharif's technology strategy types, ESFs have the choice among four options. They can extend technology by salvaging outdated and mature software, following technology by using modern and standard software designs, exploiting technology by adapting and using emerging software technology and leading/pioneering the use of technology through own state-of-the-art software designs.

Crafting the firm's technology strategy³ involves decisions on technology choice and posture (pioneering or following technological change), internal and external technology sourcing, technology portfolio over time, allocation of resources for building technological competence (distinctive skills and knowledge), and the timing of introducing technology into new products and ser-

¹ Service refers to software.

² A dyadic relationship is an ongoing and two-way process by which each entity influences the other.

³ Technology strategy is a portfolio of choices and plans to address the technological threats and opportunities in the firm's external environment (Maidique and Patch, 1988).

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