Abstract - The main aim of this article is to gain the understanding of the business startup factors and entrepreneurial strategies employed by SMEs in high technologies in Thailand. This research takes a qualitative approach and descriptive statistics in exploring the relationship between start-up factors, innovation strategies and firm performance of high-tech entrepreneurs in Thailand. Case study of 4 entrepreneurial organizations and in-depth interview with CEOs/founders were conducted to compute findings.

The study has found that 3 out of 4 companies use imitation strategy, only 1 company uses first mover strategy. All of them use alliance strategy. All companies have growth rate during past 3 years, the first mover company has the highest growth rate. All entrepreneurs have high readiness of business start-up factor but their businesses grow with different rate. Number of samples is only 4 samples, which is limited to provide the generalization of the entrepreneurial theory. Sample companies are all in Information Technology cluster and may not be the good representatives of high-technology clusters.

Keywords - Strategy, Innovation, and Performance

I. INTRODUCTION

Thailand government has been pushing SME development policies by funding major SMEs, manufacturing firm and agricultural firm to stimulate economic growth. The fact shows that those SME development policies cannot achieve economic objectives. There is less than 5 percentages of new firms can contribute to expected economic objectives. The principle of financial management theory states the business heuristics of high risk also high return. Agricultural industry is low-risk business and yields low return. Therefore, if Thai government expects high return or high growth on economics, higher risk will be involved. High technology business possesses high risk and high return, the investigation of high technology especially in Information Technology (IT) SME development, strategy and performance will be the foundation of this research, which will be beneficial to the planning of Thai government SME policies.

The purposes of this study are to: (i) identify the innovation strategies of high technology firms; and (ii) investigate innovation strategies of high technology firms that can be guideline for new entries of SMEs in high technology clusters.

The objectives of this research are to identify strategic type business start up factors and performance, we conduct case studies on five Thailand’s high-technology SMEs firms, and analyze their growth histories in past 3 years. Case studies can be useful in investigating how each firm has grown in context to the others and comparing
similar strategies in different business start up factors.

The following questions will be researched through this research paper:

**RQ01:** Do entrepreneur start-up factors affect the high-tech-entrepreneur’s innovation strategies and firm’s financial performance? How?

**RQ02:** Does each entrepreneurial strategy affect the financial performance of high-tech entrepreneurs? How?

**II. RESEARCH DESIGN**

All of the four cases in this paper are Thailand’s high-technology SME firms that were found by Thai people and unsupported by any Thailand government fund. All firms were established by business opportunities and vision of founder.

All firms are mainly software-consulting and development base. Each case was developed by face-to-face and telephonic in-depth interviews with founders. We focused on firm’s technological strategies-start up factors relationship that affect to firm’s performance. Sale and profit are used to represent performance.

This exploratory case study investigated technological strategies: first mover, imitation and alliance, and business start up factors in Timmons model approach; business opportunities resources and team. Technological strategies are measured by characteristics of their strategies. The business start-up factors are measured by business owner attitude on assumption that has equal degree of importance. Finally, firm’s performances are measured by the size of total sales, average sale growth rate and return on assets (ROA) for the last three years.

**III. LITERATURE REVIEW**

We will cover the literature review of Timmons model (Timmons and Spinelli, 2007), entrepreneurial innovation strategy and performance measurement of SME firms. Timmons model of the Entrepreneurial process is to balance 3 driving forces of Opportunity, Resources and Team with the holistic approach in creating the new venture. Central theme is that the highly dynamic entrepreneurial process is opportunity-driven, resource parsimonious, led by entrepreneur and entrepreneurial team and finally must be with sustainability. The core of the process is the “Opportunity”. Ideas of would-be entrepreneurs cannot attract investors during the due to the diligence process if those would-be entrepreneurs cannot identify the exact prospective customers and markets. Opportunity can be explained with market demand (market share and growth potential, ability to reach the customer), market structure and size (emerging segments or fragmented segments, proprietary barrier to entry), margin analysis (gross margin percentage, competitive capital requirement, breakeven point, economic value added). Resources include the financial resources, assets, creative people, and business plan. Quality entrepreneurs prefer to minimize and control rather than to maximize and own. The “Bootstrapping” is the style of entrepreneurs starting the business. They should “Think Cash Last” and “Conserve your Equity” to sustain the growth and maximize shareholder value. Entrepreneurial team consists of entrepreneurial leader and the quality team. Entrepreneurial leader can learn and teach their team well and fast, can be flexible and tolerate with uncertainty. He/she should also build the entrepreneurial culture in the organization. For the team to have entrepreneurial quality, they must possess relevant experience and track record, obsessed with opportunity, motivated to excel, has the creativity, adaptability, locus of control, tolerate with risk, ambiguity and uncertainty. In addition, team member should have courage, leadership, and good communication skills. Rewarding, sharing success and failure among team members and stakeholders are the key attributes of entrepreneurial leader.
Entrepreneurial Innovation Strategy

Dorf and Byers (2008) argues that the entrepreneur can build an effective strategy for innovative business in different ways. Most innovators perceive the advantage of being the first to market. First mover can enjoy the brand recognition, the trust and relationship with customers and suppliers, the shorter learning curve, higher skills and experience as time passes by. However, to be the first in the market cannot guarantee the sustainability of their businesses; new entrepreneurs must encounter the technology market, and economic uncertainty, the industry regulation, the pressure from customers, competitors, suppliers, and complementors. Therefore, firms may seek alternatives to first mover innovation strategy by using the imitator strategy or alliance/partner strategy to achieve the creation of innovative products or services to their customers. The imitator strategy helps reducing the risk occurred in investing own R&D effort and expenditure, the risk of introducing completely new products or services to existing customers. Imitator is the replication or close copying of existing best practices of first movers. However, the imitator strategy has its own pitfalls. The imitation can be unsuccessful if the firms are lack of understanding in business and technology environments. The success stories in developed countries may not be successful in developing countries. Therefore the direct copying of ideas, products, services without adaptation, or so-called localization, to local environment can be the deteriorate the firm performance by not satisfying its customers, suppliers and complementors. In developing countries like Thailand, technology transfer activities are most common in high-technology entrepreneurs. They are not the developers of the key technologies but they are the implementers or practitioners of those globalized technologies. For example, Microsoft and Sun Microsystems, based in United States, are key technology developers of .NET and J2EE technologies in IT business. SAP, based in Germany is the key technology developer in ERP (Enterprise Resource Planning) software package like SAP. Most Thai entrepreneurs are the implementers of these technologies. This leads to another innovation strategy of alliance/partner strategy. A partnership or alliance is an association of two or more firms that agree to cooperate with one another to achieve mutually compatible goals that would be difficult for each to accomplish alone (Spekman, 2000). New venture has its technological and innovative value to attract customers, suppliers, competitors, and complementors. This creates the “Value Network”. Value network is very important to the new venture because it helps reducing cost and time incurred in acquiring the specific resources and capabilities. (Hitt, Ireland and Hoskisson, 2005). Firms seek alliance/partner strategy to gain the benefits in accessing deeper and wider to their customers, suppliers or complementors. Most Thai IT companies have been partnering with large IT vendors e.g. IBM, Microsoft, Sun, Oracle, and HP to gain formal/classroom technical knowledge sharing, to contact the prospective customers who are willing to be early adopters of new technologies, the benefits of lower investment on software licensing, co-develop with those large vendors to create new hardware/software platforms. Alliance/partner strategy will be less effective when roles and responsibilities are unclear, or benefits are not mutual or are unfair to relevant parties.

Performance Measurement of SMEs

Refer to the literature review work of Reijonen and Komppula (2007), they argue based upon the Murphy work in 1996 that the most commonly used performance measures are efficiency: ROI (Return on Investment), growth: (increase in sales), and profit (net profit). We rely on this financial performance measures for the period of 3 years. R&D expenditure over total investment are used to identify the
importance of innovation in each firm (Kaplan and Norton, 1996).

**Theoretical Framework**

Refer to the literature review work mentioned above; we come up with the following conceptual model.

![Figure 1 Conceptual Model](image)

**IV. RESEARCH METHODOLOGY**

This research is based on the methodology of “Case Study Research” (Yin, 2003). We use the multiple case studies and explore in details according to the study objectives. We interviewed 4 technology-based firms: SinaptIQ, Tellvoice Technology Company, Boston Network Company, and MB Systems Company, which all have grown in past 3 years. All of the surveyed companies are as follows:

**Case 1: Firm S (SinaptIQ)**

SinaptIQ was established in Thailand in early 2003 by 2 founders from Myanmar and Singapore who are Information Technology specialists. They have long experience in IT-Consulting Company and also improved management skill by having master degree of Business Administration from SASIN Business School, Chulalongkorn University, Thailand. They can find and create business opportunities that is a combination of experienced, meticulous software architects and success-driven business professionals to provide innovative services around emerging mobile technology and enterprise frameworks such as .NET and J2EE.

Mainly SinaptIQ’s customer are the Thai banking sector and its distinctly foundation. They satisfied SinaptIQ’s product, record of Access Control Server, Merchant Plug-In, and Payment Gateway system implementation developed in Thailand. SinaptIQ certified by globally recognized institutions Visa International and Master Card International, globally recognized expertise in these areas is fully available in Thailand.

**Case 2: Firm T (Tellvoice Technology Company Limited.)**

Tellvoice Technology Company Limited. was established in Thailand in early 2004 by 2 electronic engineers who are member of Ph.D. in electronic engineering. At first time they take opportunities from Ph.D. dissertation, Thai speech recognition platform, to commercial. Products of Tellvoice Technology Company Limited was developed on core competency to commercial products as voice applications and implements the platform to work with Interactive Voice Response (IVR) system. Tellvoice Technology Company Limited does in partnership with our clients in fast changing market segments such as: Telecommunication, IVR systems/solutions, Wire/wireless networks, handheld devices, Information services, Public sectors, Multimedia services/solutions and etc.

**Case 3: Firm B (Boston Network Company Limited)**

Boston Network is the leading knowledge provider company who provides corporate training, seminar, conference, public training, executive forum, productivity tools and assessment services for organizations, and teams and individuals. Boston Network helps companies succeeded by unleashing the power of their workforce to focus and execute on top business priorities. We bring in the latest business know-how, world-class cutting edge management knowledge, and valuable insights to Thai society.

**Case 4: Firm M (MB Systems Company Limited)**

M.B. System Automation Company Limited's focus is to provide results that are implemented quickly and efficiently.
Solutions are developed in partnership with the client by listening to their needs. We know listening to the customer and understanding their business needs and operation is fundamental to success. We provide the following technology-based services to develop enterprise solutions: database solutions, software design, application programming, systems integration, network design and implementation, and technical support and training.

**Instrumentation, Data Collection**

Semi-structured interview guide is used to get qualitative information side of innovation of the company as the first priority. In addition, the structured questions are used to investigate the business information of the company (financial ratios, R&D, entrepreneur view of their own business). The interview consists of both face-to-face and phone interviews.

We use statistical techniques of descriptive statistics to explore the relationship between each construct and measures.

**Scale and Measurements**

Likert scale of 5 is used in the research for the start-up factors survey, while the firm performances in financial perspectives are surveyed in numerical format.

**V. RESEARCH FINDINGS AND ANALYSIS**

**Research Findings**

SinaptIQ has many resources for business start up and maintain. The first investment comes from both of founders is totally 1,000,000 Baht. For the team, also mainly by themselves. Tellvoice Technology Company Limited has strong resources for business start up especially products, own products and Boston Network Company Limited was established in Thailand in August 2004. The first investment is totally 1,000,000 Baht., including intellectual properties, and team who are professional in speech recognition technology. The first investment is totally 2,000,000 Baht. MB Systems Company Limited was established in Thailand in mid-year 1992, it has a start-ups registered capital 1,000,000 Baht. Business start-up factor, firm’s strategies and firm’s performance are presented in Table 1:
### Table 1 Business start-up factor, firm’s strategies and firm’s performance

<table>
<thead>
<tr>
<th></th>
<th>Firm M</th>
<th>Firm S</th>
<th>Firm B</th>
<th>Firm T</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Business start up factors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Opportunity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industry</td>
<td>4.25</td>
<td>3.75</td>
<td>4.25</td>
<td>3.50</td>
</tr>
<tr>
<td>Market</td>
<td>4.25</td>
<td>4.50</td>
<td>3.75</td>
<td>2.25</td>
</tr>
<tr>
<td>Product</td>
<td>4.40</td>
<td>2.40</td>
<td>3.80</td>
<td>2.80</td>
</tr>
<tr>
<td><strong>Resources</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finance</td>
<td>3.50</td>
<td>2.25</td>
<td>3.00</td>
<td>3.00</td>
</tr>
<tr>
<td>Assets</td>
<td>5.00</td>
<td>1.50</td>
<td>5.00</td>
<td>5.00</td>
</tr>
<tr>
<td>Human</td>
<td>5.00</td>
<td>2.50</td>
<td>2.00</td>
<td>3.50</td>
</tr>
<tr>
<td>Strategies</td>
<td>2.00</td>
<td>2.00</td>
<td>3.50</td>
<td>4.00</td>
</tr>
<tr>
<td><strong>Team</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Management</td>
<td>4.20</td>
<td>3.40</td>
<td>4.80</td>
<td>5.00</td>
</tr>
<tr>
<td>Practice</td>
<td>3.00</td>
<td>2.91</td>
<td>4.36</td>
<td>4.91</td>
</tr>
<tr>
<td><strong>Firm’s strategies</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First mover strategies (7)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>5 (71.43%)</td>
</tr>
<tr>
<td>Imitation strategies (7)</td>
<td>6 (85.71%)</td>
<td>6 (85.71%)</td>
<td>3 (42.86%)</td>
<td>-</td>
</tr>
<tr>
<td>Alliance strategies (8)</td>
<td>4 (50.00%)</td>
<td>5 (62.50%)</td>
<td>6 (75.00%)</td>
<td>5 (62.50%)</td>
</tr>
<tr>
<td><strong>Firm’s performances (2007)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sales</td>
<td>18 million Baht</td>
<td>18 million Baht</td>
<td>12 million Baht</td>
<td>10 million Baht</td>
</tr>
<tr>
<td>Net profit</td>
<td>3.6 million Baht</td>
<td>6 million Baht</td>
<td>4 million Baht</td>
<td>-</td>
</tr>
<tr>
<td>ROA</td>
<td>34.28%</td>
<td>-</td>
<td>80%</td>
<td>-</td>
</tr>
<tr>
<td>Total investment</td>
<td>10.5 million Baht</td>
<td>5 million Baht</td>
<td>5 million Baht</td>
<td>-</td>
</tr>
<tr>
<td>R&amp;D investment</td>
<td>200,000 Baht</td>
<td>4.5 million Baht</td>
<td>300,000 Baht</td>
<td>2 million Baht</td>
</tr>
<tr>
<td>Registered capital (now)</td>
<td>4 million Baht</td>
<td>5 million Baht</td>
<td>3 million Baht</td>
<td>-</td>
</tr>
</tbody>
</table>

**Remark for start-up factors**
- Score 1.00-2.33 means weak or poor start-up readiness.
- Score 2.34-3.66 means fair or moderate start-up readiness.
- Score 3.67-5.00 means strong start-up readiness.

**For strategy**
- Score 1.00%-33.33% means weak or poor use of strategy execution.
- Score 33.34%-66.66% means fair or moderately use of strategy execution.
- Score 66.67%-100.00% means strongly use of strategy execution.
Analysis of Firm S
Under opportunity approach, industry and market factors are very attractive (3.75 and 4.50 respectively). But product factors are moderated attractive (2.40). Resources approach, almost of resources are weakness: finance, assets and strategic (2.25, 1.50 and 2.00 respectively) except human resources (2.50). The last approach, team, both of team factors: management and practice are fair capability (3.40 and 2.91 respectively). Firm’s strategies, SinaptIQ strongly uses imitate strategies (85.71%) and moderately uses alliance strategies (62.50%). Firm’s performance, sale and profit growth rate is 157% and 71%.

Analysis of Firm T
Under opportunity approach, industry and product factors are moderated attractive (3.50 and 2.80 respectively) while market factors is poor attractive. But product (2.25). Resources approach, financial and human resources are fair (3.00 and 3.50 respectively). Both of assets and strategic are strongly capability (5.00 and 4.00 respectively). The last approach, team, both of team factors: management and practice are strongly capability (5.00 and 4.91 respectively). Firm’s strategies, Tellvoice Technology Company Limited strong uses first mover strategies (71.40%) and moderately uses alliance strategies (62.50%). Firm’s performance, sale growth rate is 233 %.

Analysis of Firm B
Under opportunity approach, industry market and product factors are very attractive (4.25, 3.75 and 3.80 respectively). Resources approach, financial and strategies resources are fair (3.00 and 3.50 respectively). Resources approach, assets is strongly capability (5.00). But human resources is weakly capability (2.00). The last approach, team, both of team factors: management and practice are strongly capability (4.80 and 4.36 respectively). Firm’s strategies, Boston Network Company Limited moderately uses imitate strategies (42.86%) and strongly uses alliance strategies (75.00%). Firm’s performance, sale and profit growth rate are 100 % and 82% respectively.

Analysis of Firm M
For opportunity approach, Firm M developed and introduced very attractive product (4.4) to IT industry, very attractive industry (4.25) and also market (4.25). In addition, Firm M has many strong resources; assets and human resources (5 and 5 respectively) but it weak in strategic resources (2). The last approach, team, management is strongly capability (4.2). MB Systems strongly uses imitate strategies (85.7%) and moderately uses alliance strategies (50%). The total sales of Firm M have grown from 15 million baht in 2005 to 18 million baht in 2007 (sales growth rate 20%) and its profit has grown from 3 million baht in 2005 to 3.6 million baht in 2007 (growth rate 20%)

VI. RESEARCH ANALYSIS

Figure 2 Relationship of firm’s strategies and firm performance

Figure 2 shows that most of firms have high score of strategy execution. But firms’ performance does not depend on score, like business start-up factor. Firm S has low
score of strategies but has higher performance than firm M that has high score of strategy execution. Figure 3 shows that most of firms have relationship between business start-up factor and strategy execution.

![Figure 3 Relationship of business start-up factors and firm’s strategies](image)

**VII. CONCLUSION**

The main purpose of this paper is to provide a framework for high-technology SMEs firms strategies and to analyze growth histories in past three years. We apply Timmon’s model in business start-up factors to find relationship with strategies and to analyze firm performance that is reflected by the strategy execution.

**Business start-up factors**

Under opportunity dimension, we found all of firms agree that high-technology industry is very attractive. It shows they believe in industry expansion and they can get profit from. We can use risk and reward profile for various investment to explain it.

In market opportunity, all of firms that use imitation strategies think it is very attractive except firm T who use the first mover shows that firm T who uses the first mover strategies has the highest score. It can explain under core competencies theory, firm will be successful based upon specific and competent resources. We can find a pattern of relationship between business start-up factor firm’s strategies and firm’s performance that show in Table 5.

**Firm strategies**

Almost firms use imitation strategies except firm T uses the first mover strategies. And all of firms use alliance strategy but with degrees of alliance strategy in each firm are different.

**Firm performance and growth**

Every firm has sale growth rate in past 3 years. Firm T has the highest and firm M is the lowest.

This study shows the result that all of firms have high score of business start up or high score of strategy execution and it shows correlation that firm’s performance depends on high score of business start-up or strategy execution. We can use degree of business start up and strategies to forecast firm’s performance. If the result also has closed relationship, we can construct high degree of business factors to provide strategies for effective performance of firm.
REFERENCES
(Arranged in the order of citation in the same fashion as the case of Footnotes.)