The role of business incubators has gained recognition in both developed and developing nations. Positive outcomes of business incubators include the creation of jobs, acceleration in growth of new businesses, and revitalization of communities. This paper analyzes the strategies used by Malaysian ICT incubators in selecting prospective incubatees. A total of 118 incubatees participated in this study through a survey questionnaire and were asked about the selection process they were subjected to during their application. Exploratory factor analysis reveals that ICT incubators in Malaysia largely tend to select their incubatees based on the market characteristics that the incubatees plan to get into. Other selection criteria used product characteristics and financial characteristics of the incubatees applying.

INTRODUCTION

Business incubation research has been conducted for more than fifty years and has since evolved into many branches of research themes including incubator development, incubatee development, incubator configuration, impacts of business incubation and theories associated with business incubation. Despite the breadth of literature that gathers information on business incubation process, many of these studies have been largely conducted in developed nations such as the United States, United Kingdom, and China. Although literature on the developments of business incubation in these countries may be used as a benchmark, exact replication of their best practices in developing countries may not be effective due to many aspects such as cultural and economic disparities. A tailored and more relevant business incubation model would be of more value to the developing countries; one that would fit the nature of business environment in the specific country.

One of the key elements in business incubation process that was identified in the literature (Hackett & Dilts, 2008) is the selection performance of incubatees. The decision to select potential incubatees into the incubator as well as criteria used by venture capitalist to invest in start-up companies has been examined by previous researchers in the field (Tyebjee & Bruno, 1984; MacMillan, Zemann & Subbanarasimha, 1987; Hall & Hofer, 1993; Aerts, MatthysSENS & VandenbemPT, 2007b). Studies have shown that incubators that carefully select their incubatees tend to perform better compared to those that do not practice a proper selection performance. Despite that, the dearth of information on business incubation process in the developing countries and in a specific sector compels this research to be undertaken.

This paper examines the selection performance practice among ICT incubators in Malaysia. A total of 118 incubatees responded to the survey questionnaire which sought to understand a few issues regarding incubation process in Malaysia, including the criteria used by ICT incubators to select their potential incubatees. Statistical analyses reveal that ICT incubators in Malaysia have varying guidelines in choosing their prospective incubatees, contributing to unique strategies in determining who is more deserving to be chosen into the incubators.
To examine this issue, this paper is organised in the following fashion: First, we briefly explain the background of the research linking the role of incubators in the development of Small and Medium Sized Enterprises (SMEs), followed by a description of the business incubation scenario in Malaysia; Second, we present the literature review consisting of past research on business incubation and the development of business incubation in Malaysia; Third, we discuss the element in the business incubation process of concern: selection performance; Fourth, we discuss the sample and methodology used; Fifth, we report the results of our statistical analyses; Sixth, we discuss our findings and lay groundwork for future research. Overall, we believe our study offers important theoretical and practical insights for the literature on business incubation and development of business incubation in Malaysia.

**Background to the research**

The important role of business incubation as a useful strategy to accelerate growth and development of SMEs has been widely acknowledged in the economic and entrepreneurship literature (OECD, 1996; Lee & Yang, 2000; Aernoudt, 2004; Phan, Siegel & Wright, 2005). This role is evidenced by the growing number of incubators worldwide and testimonials from both developed and developing countries on the effectiveness of business incubation (OECD, 1999; Tamasy, 2007; Ndabeni, 2008). The faith in the incubation system is likely due to its ability in establishing SMEs at a more rapid rate and at a lower cost (Costa-David, Malan & Lalkaka, 2002). SMEs in most countries form the backbone of the economy contributing to national wealth creation via Gross Domestic Product (GDP), employment, and exports (Huang, 1999; Doyle & Hammond, 2008). Hence the sustainability of SMEs is often in most country’s top agenda including Malaysia’s.

Despite this, the role of ICT incubators in promoting new ventures in Malaysia remains unclear. To date, there has been little study done on the business incubation process in Malaysia, in particular with regards to the effectiveness of business incubation process involving elements such as selection performance, monitoring and business assistance intensity, resource allocation and professional management services (Rothaermel & Thursby, 2005; Hackett & Dilts, 2008). This paper begins with an overview of business incubation, followed by an explanation of the four elements in relation to the business incubation process, the research methodology, preliminary findings from the research, discussion, and concludes with recommendations and limitations of this current research.

In Malaysia, business incubation was first introduced in 1996 under MSC Malaysia or the Multimedia Super Corridor project. The project was developed primarily to spearhead the growth of the ICT industry in the country by providing a test-bed for the global ICT industry. Physically, it covers an area of more than 750 square kilometres extending south from Malaysia's capital city and business hub, Kuala Lumpur. MSC Malaysia provides an ideal environment for companies to harness the full potential of ICT and multimedia technologies. In promoting the development of MSC Malaysia as a key growth driver of the economy, Multimedia Development Corporation (MDeC) has been tasked to advise the Malaysian government on ICT legislation and policies as well as setting benchmark standards for ICT and multimedia operations (MSC, 1996; MDeC, 2007; Mohan, 2007).

MDeC is the governing body that collaborates with various parties and government agencies to ensure an enabling environment for both local and global ICT companies is developed. To date, MSC Malaysia has attracted participation from more than 2,000 local and multinational technology companies involved in various ICT sectors which represent major activities within the Malaysian ICT industry (MDeC, 2009). MSC Malaysia's value add contribution to Malaysia's economy was recorded at 1.2% of Gross Domestic Output of Malaysia in 2007. MSC Malaysia’s contribution to the country’s economy in terms of revenue to Gross Domestic Output in 2007 was recorded at 2.66% (MDeC, 2009). These contributions indicate the positive effects of MSC Malaysia toward the economic growth of the country.
The findings of the MDeC 2008 impact survey suggest that MSC Malaysia has progressed and achieved favourable impacts on Malaysia’s economy especially in employment creation, GDP contribution and exports. However, the role of ICT incubators in promoting the growth of ICT SMEs has been scarcely acknowledged. Particularly, a closer look at the status of ICT incubators indicate that the majority of the incubators in Malaysia are observed to provide essentially basic incubator facilities and services (Mohd Saffar, 2007). According to Lalkaka (2001), incubators in most developing countries are still trapped in the first-generation type of incubators which are the early versions of incubator models introduced in the 1980s. This situation is indicative of the Malaysian business incubation scenario where 94% of the incubators are still entrenched in the real-estate model with minimal business services as indicated in Table 1. Ironically, the number of incubators in the third-generation model which offers technology labs and more sophisticated type of business services is still somewhat low.

Table 1: Types of Organizational Forms of Incubators in Malaysia

<table>
<thead>
<tr>
<th>Number of Incubators</th>
<th>72</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Generation Incubators</td>
<td>52</td>
</tr>
<tr>
<td>Real Estate, Landlord, Shared facilities, Reactive Support</td>
<td></td>
</tr>
<tr>
<td>2nd Generation Incubators</td>
<td>16</td>
</tr>
<tr>
<td>Real Estate, Landlord, Shared facilities, Reactive Support + Consulting/Advisory</td>
<td></td>
</tr>
<tr>
<td>3rd Generation Incubators</td>
<td>4</td>
</tr>
<tr>
<td>Facilities + business advisory services + Acceleration Technology Labs</td>
<td></td>
</tr>
</tbody>
</table>

Source: (Mohd Saffar, 2007)

This situation reflects on the process of business incubation that has been practiced among ICT incubators in Malaysia. A closer look at the practice of selection performance of each of these ICT incubators would provide an explanation toward the status of these ICT incubators. There are four elements in the selection performance practice which this study inspects including managerial characteristics, market characteristics, product characteristics and financial characteristics. This paper specifically examines the extent of selection performance practice among ICT incubators in Malaysia. The study sought to understand which among the four elements do these ICT incubators tend to choose their potential incubatee based on.

**LITERATURE REVIEW**

As evident in the extant literature ‘business incubator’ has been defined in various ways by many researchers (Phan, Siegel & Wright, 2005; Voisey, Gornall, Jones & Thomas, 2006). The reason for the variation in defining business incubator could likely be due to the diverse nature of the incubator sponsors, goals, and areas of development. This is supported by Bruneel, Ratinho, Clarysse and Cock (2010) who added that the continuous growth in business incubation and the ongoing diversification of configurations has led to increased difficulty in defining business incubators precisely.

Nonetheless, the National Business Incubation Association or NBIA defines business incubator as a business assistance program targeted to start-ups and early stage firms with the goal of improving their chances to grow into healthy, sustainable companies (NBIA, 2006). Similarly, Business Innovation and Incubation Australia or BIIA (2008) defines business incubator as ‘a new hybrid type of economic development facility that combines features of entrepreneurship, business facilitation and real estate development’. For the purpose of developing this paper, both definitions are deemed adequate. The next section details the development of business incubation in Malaysia.
Incubation in Malaysia

As has been discussed previously, SMEs have been noted to contribute to Malaysia’s GDP, employment and export. In recognition of this, the government has deemed the creation and development of more SMEs a national priority, particularly SMEs in the ICT industry. As a result, the Malaysian government has taken the step to establish incubation centres under the supervision of MDeC to develop a pool of ICT SMEs. The ICT incubators are specifically aimed to capture and cluster technopreneurs from both local and foreign countries to create and nurture a critical mass of technopreneurs, SMEs, and start-up companies involved in ICT and biotechnology industries (SMIDEC, 2006).

Since they were first introduced in the late 1980s, incubators have evolved through a number of generations, with each subsequent generation becoming more sophisticated. Grimaldi and Grandi (2005) observed that the variation in types of incubators and the evolution of business incubator models over time were necessary to accommodate the requirements and needs of businesses, which in turn was the impetus that drove the diversity in services offered at incubators. Generally, the evolution of incubators can be viewed in four phases (Mohd Saffar, 2008): first-generation incubators, second-generation incubators, third-generation incubators and fourth-generation incubators as illustrated in Figure 2. Each of these incubator generations will be explained in the next section.

Figure 2: Evolution of Business Incubators in Malaysia

Elements of the Business Incubation Process

Business incubation process as acknowledged in the literature consists of a few elements. Bergek and Norrman (2008) stated incubation process consists of multiple aspects including selection practice of incubatees, business support provided by the incubators and the role of the incubator as a mediator. Scillitoe and Chakrabarti (2010) also add that other elements such as networking interaction as being a critical element in the business incubation process. Hackett and Dilts (2008) provide similar understanding of the business incubation process where their model of business incubation process includes selection performance, monitoring and business assistance intensity and resource munificence. It can be generalized that the core elements of the business incubation process consists of policies pertaining to the selection of potential incubatees, exit criteria, resources associated with developing the incubatees, equipping incubatees with the needed business acumen, and finally the funding which they would need at a later stage of their establishment. Ultimately, the business incubation process, according to Campbell, Kendrick and Samuelson (1985) creates value in four areas: the diagnosis of business needs; the selection and monitored application of business services; the provision of financing, and access to the incubator
network. The following section details the selection performance element in the business incubation process.

Selection performance

Incubators are largely associated with having policies in regard to admission and exit procedures, a ‘defining characteristic’ of an incubator model, as asserted by CSES in their 2002 benchmarking study. Selection performance (SP), or admissions criteria is often a mandatory attribute of an incubator model. The reason for having a set of selection criteria is simply because office space in incubators is usually in high demand and thus management of incubators need to be more selective in choosing businesses that are more promising. The result of early screening of entrepreneurs will yield specific type of technologies, and in some cases, demographic-specific businesses like women owned businesses or minority-owned businesses (Lambing & Kuehl, 2003). The practice of selecting tenants also helps in reducing possible entrepreneurial failures which will reflect on the credibility of incubators. A study by Aerts, Matthyssens and Vandenbempt (2007a) confirm this as they posit that tenant survival rate is positively related to a more balanced screening profile.

Various studies on the incubation process have been undertaken and suggest that selection performance is an important part of the business incubation process (Merrifield, 1987; Lumpkin, 1988; Bergek & Norrman, 2008). Aerts et al. (2007b) posit that a severe screening process would enable incubators to evaluate the presence of characteristics deemed essential to develop sound enterprises, which also agrees with Merrifield (1987), Lumpkin (1988), Hackett and Dilts (2004) and Peters et al. (2004). Another incubation model developed by Hackett and Dilts (2004) also included selection practices as part of the incubation process. Screening for future incubatees is a process that would be guided by the following attributes: managerial characteristics, market characteristics, product characteristics and financial characteristics. Incubators that follow these guidelines are deemed as following ‘best practice’ in the business incubation realm (Aerts et al., 2007b; Bergek & Norrman, 2008). The consensus amongst these researchers validates the importance of the selection process in the incubation model.

One of the more common yardsticks used by incubators in their selection process is to select tenants based on the type of business. For technology incubators, only businesses which focus on technology and technology application will be considered as tenants of the incubators, thus creating sector-specific incubators. Incubators also tend to select potential tenants based on projects with specific technology orientation and high job creation potential as reported in CSES (2002). University-linked incubators may have a different set of selection criteria in choosing their tenants. For instance, priority may be given to business ideas originating from the university researches and those that have commercialization potential. A study by Schwartz (2008) pointed out other criteria used to screen potential tenants including tenants’ business plan, financing, qualifications of the entrepreneur and properties of the product in order to gauge their market potential and the chance of success in the underlying business model.

In this study, the selection process of ICT incubators in Malaysia will be examined. A thorough investigation using a survey questionnaire will be carried out to understand the basis of their current selection criteria of tenant companies. The selection process used in this model is based on four criteria which include managerial characteristics (whether or not the potential tenant has any prior employment experience and technical expertise), the properties of the market which the applicant intends to enter, the characteristics of the intended product or service to be commercialized and the financial characteristics of the potential tenant.

METHODOLOGY

This research adopted the mixed methods approach consisting of quantitative survey and in-depth qualitative interview guided by an interview protocol. However, at this point in time, only preliminary results from the quantitative study will be presented to meet the purpose of this paper. Online survey questionnaire and manually inserted data were used to gain response from incubatees of ICT incubators in Malaysia.
Participants

Participants for the survey questionnaire were identified through the respective incubator managers. Basic information regarding the name of the incubatees, email address and phone numbers were also available from the incubatees’ websites which could be accessed from the incubator’s website. However, only a few incubators made this information accessible through their websites. The rest provided the contact details of the incubatees after the interviews were completed. The participants are made up of companies that are tenants of the incubators that have been chosen for the qualitative part of the research. These companies are mostly ICT-based companies with diverse business nature ranging from mobile and wireless communication to internet-based business applications in the financial sector. A letter of invitation was first extended to the incubatees by email for their consent to be part of the study. A total of 180 incubatees were expected to be the participants of the survey questionnaire. Upon receiving their approval to partake in the study, participants were then informed of the the link to the website containing the survey questionnaire. This method of distribution was thought by the researcher as more accessible, effective and less confronting to the incubatees. However, to ensure that the number of incubatees reach at least one hundred, the researcher took the opportunity to distribute 80 more questionnaires at the Innovation Week, held from 30-31 March 2010 in Kuala Lumpur. The researcher had appointed a research assistant to distribute and collect the survey questionnaire at the conference. The total number of survey questionnaire obtained from the Innovation Week was forty nine. All forty nine questionnaires were mailed back to the researcher in Melbourne at the end of April 2010. Data from the questionnaire were keyed in manually into the website where the online questionnaire is located. Data from the website were then extracted into SPSS Version 18.0 and analyses were able to conduct. As of end of May 2010, the total number of participants totaled to 118 participants. This yields to a response rate of 65.5 per cent. This sample is generally representative of the ICT incubator tenants in Malaysia and appropriate for use in exploring the incubation process.

Measures of Selection Performance

Selection performance refers to the degree to which the incubator behaves like an “ideal type” venture capitalist when selecting emerging organizations (options) for admission to the incubator. Relevant dimensions of selection performance include a propensity to select an emerging organization for admission to the incubator based on managerial characteristics, market characteristics, product characteristics and financial characteristics. Managerial characteristics refer to the prior employment experience and technical expertise of the applicant’s management team. Market characteristics refer to the properties of the market which the applicant intends to enter. Product characteristics refer to the properties of the product or service which the applicant intends to commercialize. Finally, financial characteristics refer to the profit potential of the applicant. Ceteris paribus, incubators that operate like venture capitalists and emphasize the importance of managerial team characteristics, market and product characteristics, and expected financial outcomes (Riquelme and Watson, 2002) in selecting candidates for incubation can be expected to outperform incubators that do not.

To date, various selection criteria have been used as a guide to decide on potential incubatees. The scales used for this study have been previously used and validated by Hackett and Dilts in their study. Hackett and Dilts (2008) used the DeVellis’ (2003) method to develop the scales which resulted in the validation of eight reliable, multi-dimensional scales as well as multiple refinements to the original incubation model (Hackett & Dilts, 2008, p.2). The scales used were aimed to gauge how much incubatees agree with the statements provided regarding selection performance. Following generally accepted conventions in social science research, Hackett and Dilts adopted ordinal scales: 7-point Likert-type scales to ask the respondents to rate levels of importance, agreement, and ability vis-a`-vis the constructs of interest. This format is appropriate because the scales under development will be used in a study that calls for the business incubation professionals to report their perceptions of the operational setting of the incubator; and “Likert scaling is
widely used in instruments measuring opinions, beliefs and attitudes” (DeVellis, 2003, p. 79). Exploratory statistical testing of the pilot test results indicated that the items obtained a generally normal distribution and performed reliably.

Table 3: Selection performance items

<table>
<thead>
<tr>
<th>Selection Performance (1=Strongly Disagree, 2=Disagree, 3=Neither agree nor disagree, 4=Agree, 5=Strongly Agree)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managerial characteristics</td>
</tr>
<tr>
<td>Q1 We perceive prior work experience in the field to be important in the selection process</td>
</tr>
<tr>
<td>Q2 We perceive prior management experience to be important in the selection process</td>
</tr>
<tr>
<td>Q3 We perceive technical expertise within the management team to be important in the selection process</td>
</tr>
<tr>
<td>Q4 We perceive entrepreneurial experience to be important in the selection process</td>
</tr>
<tr>
<td>Market characteristics</td>
</tr>
<tr>
<td>Q5 We perceive long-term strategic orientation to market growth to be important in the selection process</td>
</tr>
<tr>
<td>Q6 We perceive size determination of the target market to be important in the selection process</td>
</tr>
<tr>
<td>Q7 We perceive accessibility of the target market to be important in the selection process</td>
</tr>
<tr>
<td>Q8 We perceive incubatees' potential in creating new markets to be important in the selection process</td>
</tr>
<tr>
<td>Product characteristics</td>
</tr>
<tr>
<td>Q9 We perceive the uniqueness of the product to be important in the selection process</td>
</tr>
<tr>
<td>Q10 We perceive patent protection of the product to be important in the selection process</td>
</tr>
<tr>
<td>Q11 We perceive having a technological edge to the product to be important in the selection process</td>
</tr>
<tr>
<td>Q12 We perceive having a relative advantage over competitor's product to be important in the selection process</td>
</tr>
<tr>
<td>Q13 We perceive rareness of the product to be important in the selection process</td>
</tr>
<tr>
<td>Q14 We perceive inimitability of the product to be important in the selection process</td>
</tr>
<tr>
<td>Q15 We perceive substitutability of the product to be important in the selection process</td>
</tr>
<tr>
<td>Financial characteristics</td>
</tr>
<tr>
<td>Q16 We perceive profit potential of the company to be important in the selection process</td>
</tr>
<tr>
<td>Q17 We perceive the strong likelihood of achieving financial break-even in a short period of time to be important in the selection process</td>
</tr>
<tr>
<td>Q18 We perceive the potential to attract investment participation from venture capitalists to be important in the selection process</td>
</tr>
<tr>
<td>Q19 We perceive having multiple, harvestable exit options to be important in the selection process</td>
</tr>
<tr>
<td>Q20 We perceive having a good cash flow to be in the selection process</td>
</tr>
</tbody>
</table>

Validity and reliability of questionnaire

This study addresses issues regarding the validity and reliability of the present research instrument based on Hair et al.’s (2010) guidelines on content and construct validity. Content validity, or also known as face validity, refers to the assessment of the correspondence of the variables to be included in a summated scale and its conceptual definition (Hair, Black, Babin & Anderson, 2010). This form of validity aims to ensure that the selection of scale items extends past just empirical issues to also include theoretical and practical considerations.

The survey questionnaire used in this research was adapted from a previously conducted study by Hackett and Dilts (2008). The scales in that particular study have been thoroughly developed and validated. To ensure validity for this present questionnaire, the researcher has conducted a pilot study to a group of individuals consisting of entrepreneurs, entrepreneurship researchers and other post graduate students alike. The feedback obtained
from these individuals helped in improving the clarity of the questionnaire in terms of use of rephrasing the questions.

**Procedure**

The link to the online survey questionnaire was emailed to the incubatees of ICT incubators in February 2010. The data collection reached 118 respondents by end of May 2010. Of these 118 respondents, sixty nine incubatees responded directly using the online survey tool while forty nine responses were keyed in manually from the hard copy survey responses which were gathered from the Innovation Week 2010.

**Statistical procedures**

Data analyses were undertaken in two principal stages (data screening and exploratory factor analysis (EFA)) using SPSS Version 18.0. As part of the preparation and screening process, data were tested for violations of statistical assumptions (e.g., multicollinearity, outliers, normality) and identifying missing data. Data screening revealed that there were no missing data. EFA involving principal axis factoring with varimax rotation was used to determine the number of factors associated with selection performance. EFA was conducted to eliminate survey items with loadings <0.3 on factors (Hair *et al.*, 2010) and to determine initial patterns of factor loadings that could subsequently be utilized in the CFA process. An underlying assumption of this statistical procedure is to find out whether items cluster to form factors. Items that correlate with each other are assumed to represent a similar factor. In order to extract factors, different statistical criteria can be applied. In this case, factor extraction was based on eigenvalues which are greater than one (Kaiser, 1961) and a scree plot test (Cattell, 1978). Factors which eigenvalues are after the point where the eigenvalue line drops beyond the first set of extrapolation are excluded.

**RESULTS**

**Response Characteristics**

The sample is consistent with sampling frame characteristics as discussed in Section 4.3.1, amounting to a total of 118 incubatee managers of ICT incubators in Malaysia. Firms surveyed were representative of ICT incubatees population in Malaysia. Of the 180 questionnaires that were distributed both in person and online to tenants of ICT incubators, 118 were returned at a response rate of 65.5% which is considered high by Instructional Assessment Resources (IAR).

**Non-Response Bias**

Based on the sample representation of the population, non-respondents composed of incubatee managers who were unable to respond to the survey questionnaire due to their busy schedule and for whatever reason were unwilling to participate in the research. The favourable response rate and the similarity in demographic profile between the sample and the sampling frame suggest that non-response bias is not an issue.

**Response Bias**

To overcome response bias the anchors used for questions with agreement scale consisted of 2 response options for agreement, 2 response options for disagreement and 1 response option for neither agree nor disagree. This ensures that respondents are not confined to either side of the agreement spectrum (i.e. agree or disagree). The survey questionnaire used in this research was adapted from a previous research conducted by Hackett and Dilts (2008) where thorough development and validation of the scales for the constructs have been conducted. Hence, the issue of response bias was also addressed by ensuring that questions in the questionnaire were clear, precise, and relatively short. The researcher also avoided any leading questions, double-barrelled or double negative questions in the survey questionnaire. The procedures taken by the researcher have helped in reducing the possibility of response bias in the survey questionnaire.
Missing Data
According to Tabachnik and Fidell (2007), missing data is one of the most common problems researchers face. However, the data set generated by the questionnaire responses appears to be complete without any missing data. Hence, procedure to overcome the problem of missing data was not necessary in this present research.

Demographic Data
Demographic data regarding the incubatees surveyed will be presented to provide context for further analysis. The following table highlights demographic characteristics of the sample of the incubatees surveyed across the type of managers of ICT incubatees in terms of position in the company; length in current position; age group; gender; and their academic qualifications.

Table 4: Demographic data of incubatee managers

<table>
<thead>
<tr>
<th>Position in company</th>
<th>Length in current position</th>
<th>Age group</th>
<th>Gender</th>
<th>Academic qualifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>&lt; 1-3</td>
<td>18-29</td>
<td>M</td>
<td>Masters/Postgraduate</td>
</tr>
<tr>
<td>2</td>
<td>1-3</td>
<td>30-39</td>
<td>M</td>
<td>Undergraduate Degree</td>
</tr>
<tr>
<td>3</td>
<td>&gt; 3</td>
<td>40-59</td>
<td>F</td>
<td>Diplo</td>
</tr>
</tbody>
</table>

(Position in company: 1 = Managing Director, 2 = General Manager, 3 = CEO, 4 = Deputy Managing Director, 5 = Other)

In most cases, surveyed incubatees have been operating for more than 3 years (64.4%), while 24.6% have been operation for 1-3 years. From the 118 incubatees surveyed, 11% are still within their first year of establishment. The sample provides a wide range of incubatees from the both the government incubators as well as the private and university-linked incubators. Of the 118 incubatees, 54.2% were from government linked incubators, 35.6% were from the private incubators and 10.2% from the university linked incubators.

The table details that of the 118 respondents, 67.8% were male and 32.2% were female. Male respondents appear to have more experience based on the length of time they have been in the current positions as head of their firms, indicating that there are less females in managerial positions in SMEs.

Descriptive Data
The means, standard deviations and minimum and maximum values were computed for each of the variables and are attached in the Appendix. All measures demonstrate a satisfactory range of variance, indicating that the measures are useful for a correlation study. Additionally, frequency analysis of the variables show that all items have scores spanning the entire range of the respective scales suggesting that floor or ceiling effects are not a significant issue.
Table 5: Pearson’s correlation, means and standard deviations

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>S.D.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Managerial Characteristics</td>
<td>16.4237</td>
<td>2.92764</td>
<td>.760 **</td>
<td>.517 **</td>
<td>.711 **</td>
<td></td>
</tr>
<tr>
<td>(2) Market Characteristics</td>
<td>16.8559</td>
<td>2.70572</td>
<td>.760 **</td>
<td>1</td>
<td>.578 **</td>
<td>.661 **</td>
</tr>
<tr>
<td>(3) Product Characteristics</td>
<td>24.0424</td>
<td>4.68384</td>
<td>.517 **</td>
<td>.578 **</td>
<td>1</td>
<td>.548 **</td>
</tr>
<tr>
<td>(4) Financial Characteristics</td>
<td>20.7034</td>
<td>3.41016</td>
<td>.711 **</td>
<td>.661 **</td>
<td>.548 **</td>
<td>1</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (1-tailed).

Preliminary Analysis

In order to identify the underlying factors of ICT incubator performance, the data set was prepared for analysis using SPSS Version 18.0. Principal Component Analysis (PCA) was selected as the method of analysis as a result of strong theoretical support for this approach in reducing large data sets to something more interpretable.

Prior to conducting multivariate analyses, preliminary data analysis was conducted including visual inspection of the data, identification of outliers, and an assessment of the central tendencies of the data (Hair et al., 2010).

First, the data were visually inspected to assess their normality. According to Hackett and Dilts (2008), the data need not be perfectly normal and it is possible to assert the approximate normality of underlying theoretical distribution based on the descriptive statistics for each item. Upon assessment, all items obtained normal distributions and were retained for further analyses.

Second, the researcher examined whether common method variance was an issue and this was done using the Harman’s one-factor test (Podsakoff & Organ, 1986). All items were entered together into a factor analysis and the results of the unrotated factor solution were examined. Substantial common methods variance would be present should a single factor emerge or one general factor accounting for most of the covariance in the independent variables (Podsakoff & Organ, 1986). The results revealed that 13 factors emerged with the primary item explaining only 41% of the variance. This suggests that the risk of common methods variance is low (Podsakoff & Organ, 1986).

Third, identification of outliers was conducted using procedures from Hair et al. (2010): the standardized means of each variable were examined with a view to identifying cases where the standardized means exceeded ±2.5 suggesting the possibility of being an outlier. Data revealed that there were no outliers.

Fourth, data were also examined for skewness and kurtosis. Following Curan et al. (1996), a skewness statistic between -2 and 2 was deemed acceptable; a kurtosis statistic between -7 to 7 was deemed acceptable. Ultimately, all data met the acceptable ranges and supported the univariate normality and were retained for further analyses.

Extracting and Determining the Number of Components

As detailed in the previous section PCA was computed on the data set containing 118 responses across 74 items. To achieve parsimony, Tabachnik and Fidell (2007) consider desirable that each item loads significantly on only one component. However Hair et al. (2010) state that “most factor solutions do not result in a simple structure solution (a single high loading for each variable on only one factor)” and given that the objective is to minimise the number of significant cross-loadings, the authors advocate that items with significant loadings on several factors should be considered for deletion. Further, the authors added that after an examination of the correlation matrix and the communalities for each item, items that do not load on any component or do not meet the critical 0.50 communality level (which explains 50% of the variance of each item) should also be considered for deletion. The Cronbach’s Alphas for all four components are as illustrated in Table 6.
Unidimensionality

EFA was conducted to assess the unidimensionality of the selection performance, monitoring and business assistance intensity, resource allocation and professional management services. Specifically, principal component analysis was used with varimax rotation as this criterion facilitates the unidimensionality test by “simplifying the columns of the factor matrix” and providing a clear separation of factors (Hair et al., 2010). Items that had values of less than 0.3 were suppressed (the threshold for an item properly loading onto a dimension and having practical significance) and items were sorted by size. Factor loadings were generally aligned with previous research and conceptual understanding of the underlying structure of the data with a few items loading on multiple factors. Hair et al. (2010) suggest that each item must load on just one factor to be able to assert a reasonable degree of unidimensionality. Thus, the researcher employed an iterative, trial-and-error process of respecifying the factor analytic model, followed by examination of wording of each item in an effort to find common threads that led to the factor loadings obtained.

Selection performance

The EFA of the items composing the selection performance construct resulted in three factors (see Table 6.1), one less factor from the theoretical framework, with loadings that were generally aligned with expectations. Factor 1 composed of items intended to measure selection of incubates based on the market potential of the incubates. Item loadings on this factor were as expected except for items 9a, 9b, 9c and 9d which had been theorized to form another factor. This separate factor was intended to measure selection based on managerial characteristics. Factor loadings of the items range from 0.53 to 0.77. Factor 2 composed of items intended to measure selection based on product’s characteristics. All items loading on this factor to some extent addressed the issue of product characteristics and loaded as expected. Specifically, items addressed the inimitability of the product, rareness of the product, substitutability of the product, uniqueness of the product, and patent protection of the product. Two theoretically derived items which supposedly loaded on this factor were found to cross load with Factor 3, which is intended to measure the selection based on financial characteristics. These two items were “Having a relative advantage over competitor's product” and “Having a technological edge to the product”. Factor 3 composed of items intended to measure the selection of incubates based on how profitable the firm or company will be. The cross loads that occurred between these two factors may have been possible as there might be a relationship between prior firm owner’s experience and profitability of the company. Collectively, the three factors explained 64.6% of the variance.
The findings suggest that selection performance practice amongst ICT incubators in Malaysia is based on three main factors: market characteristics, product characteristics, and financial characteristics. It appears that managerial characteristics’ items have loaded on the market characteristics factor for possible reasons. The following section discusses the findings in more detail.

DISCUSSION AND CONCLUSIONS

The findings confirm that the extent selection performance being practiced in ICT incubators in Malaysia revolves around three main areas, which are market characteristics, product characteristics, and financial characteristics.

Selection based on market characteristics is made using the following guidelines. ICT incubators in Malaysia tend to select their incubatees based on the long-term strategic orientation to market growth. Besides that, the incubators also tend to select their incubatees based on the firms’ potential in creating new markets. Other market characteristics that are used as a guideline to choose potential incubatees include size determination of target market and accessibility of target market. The rationale of selecting future incubatees based on market characteristics by ICT incubators may well be supported in the literature. This information is often available in business plans that are submitted to the incubators. By knowing the kind of market that the product or services may attract, incubators would feel more confident with their selection and could also offer networking possibilities for the incubatees. As stated in the concluding paragraph of the previous section, items originally intended to measure selection based on managerial characteristics appear to have loaded on the market characteristics factor. The reason for this could be that the ability to understand the potential of the product or service in a target market by the incubatees could also be explained by the amount of experience that the entrepreneur has.

Secondly, product characteristics are viewed as another important criterion in the selection performance. These characteristics are measured based on a range of criteria including how inimitable the product is, the rareness of the product, the substitutability of the product, uniqueness of the product, whether or not the product has patent protection, and the product’s relative advantage over competitor’s product. Many of the ICT incubators tend to go with the product-specific or idea-focused selection in choosing future incubatees. This is consistent with Bergek’s and Norrman’s (2008) findings where there seems to schools of thoughts when choosing potential incubatees: idea-focused selection, or entrepreneur-focused selection.

Thirdly, financial characteristics are also seen as an important guideline by these ICT incubators in choosing their potential incubatees. Financial aspects of the future incubatees which are looked upon include having a good cash flow, the likelihood of the company achieving financial break-even in a short period of time, having multiple, harvestable exit options, profit potential of the company, and lastly, potential to attract investment.
participation from venture capitalists. Similarly, incubators would seek this information within the business plans submitted by the incubatees.

In summary, the extent of the selection performance being practiced in ICT incubators in Malaysia still mirrors first and second-generation type of incubator models. In order for Malaysian ICT incubators to move on to third- and fourth-generation type incubators, a more stringent and guided selection criteria need to be in place. Careful selection of potential incubatees will also provide venture capitalists with more confidence in investing in start-up companies, and ultimately, contribute to the betterment of the incubator performance.

LIMITATIONS AND FUTURE RESEARCH

This research is limited to a specific type of business incubators, i.e. ICT incubators and therefore implications from this study may not be generalizable for three reasons. Firstly, the small sample size prevented the use of confirmatory factor analysis techniques (Hackett & Dilts, 2008). Secondly, the incubation industry will continue to evolve at different rates and paths depending on the local business conditions and cultural variances. Finally, the population of business owners in this study is quite variable in terms of their experience, academic qualification and age, suggesting that despite good reliability statistics, their responses may not have reflected similar contexts.

The Hackett-Dilts incubation model adapted in this study managed to delve deeply into the operational setting of business incubators and the incubation process to both confirm popularly held assumptions regarding the process of incubating ventures as well as to reveal an underlying set of factors that have received little attention in the literature. Going forward, the causal relationship between the selection performance and the performance of incubator firms could well be examined at a later stage of the study, where regression analysis would be commonly undertaken. Future research could extend this research to a wider sample, and include other sectors of incubators besides ICT.

From a theoretical perspective, the factors identified and the scales that are developed have helped lay the key factors for the facilitation of the entrepreneurial process in Malaysia: it is possible to identify and measure the factors of the business incubation process. From a practical standpoint, the scales developed in this study could be use to test hypotheses related to the development of new ventures, and could provide guidance for researchers, venture capitalists, incubator managers and entrepreneurs vis-à-vis facilitating the entrepreneurial process.
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