Creation of a step-by-step process in the pre-startup of a micro business

Dan-Ching Huang,
Tzong-Ru Lee*

Department of Marketing,
National Chung Hsing University,
250 Kuo Kuang Road, Taichung 402,
Taiwan, Republic of China
Email: trlee@dragon.nchu.edu.tw
*Corresponding author

Per Hilletofth

Department of Industrial Engineering and Management,
School of Engineering,
Jönköping University,
Jönköping SE-551 11, Sweden
Email: per.hilletofth@jth.hj.se

Ching-Kuei Kao

Department of Business Administration,
Hsing-Kuo University of Management,
No. 600, Sec. 3, Taijiang Blvd., Annan District, Tainan 709,
Taiwan, Republic of China
Email: ckkao@mail.hku.edu.tw

Abstract: This study proposes a systematic process in the pre-startup stage of establishing independent and franchised catering micro businesses. A questionnaire based on the key success factors (KSFs) affecting the establishment of a micro business was developed. Grey relational analysis (GRA) was performed to determine KSFs that can affect the start of a catering micro business, while interpretive structure modelling (ISM) was used to establish the pre-startup process. Studies show that GRA and ISM results were different in the two types of catering businesses. Therefore, business starters ought to investigate their industry of interest and determine the startup process prior to establishing their respective businesses.

Keywords: catering micro businesses; grey relational analysis; interpretive structure modelling; key success factors; pre-startup stage.


Biographical notes: Dan-Ching Huang is currently in the Department of Marketing, National Chung Hsing University, Taiwan, Republic of China.
Tzong-Ru (Jiun-Shen) Lee is a Professor of Marketing Department, former Chairman of Marketing Department and formal Chairman of Institute of Electronic Commerce and former Chairman of Center for Electronic Commerce and Knowledge Economics Research in National Chung Hsing University in Taiwan. He is a Fulbright Visiting Professor in USA in 2006. He is a joint author of four books. His researches mainly focus on SCM, CRM, marketing, EC, risk management and business ethics. Also, he is an Editor-in-Chief of *IJECRM* and an Associate Editor of *IJLEG*.

Per Hilletofth (PhD) is a Professor of Operations and Supply Chain Management at Jönköping University in Sweden. He holds a PhD in Technology Management and Economics (with specialization in Logistics and Transportation Management) from Chalmers University of Technology (Sweden). His research focuses on operations and supply chain management with an emphasis on strategy, sourcing, demand and supply planning, information systems and sustainability. He published articles in various international journals including *Industrial Management and Data Systems*, *Expert Systems with Applications*, *International Journal of Shipping and Transport Management*, and *European Business Review*. Currently, he is in the Editorial Board for *Industrial Management and Data Systems*, *World Review of Intermodal Transportation Research*, *International Journal of Logistics Economics and Globalization* and *International Journal of Management in Education*.

Ching-Kuei Kao is currently in the Department of Business Administration, Hsing-Kuo University of Management, Taiwan, Republic of China

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1 Introduction

In the past, the manufacturing industry was considered as the core of establishing businesses in Taiwan; thus, entrepreneurs had to possess sufficient capital, land and manpower. However, given the inability to sustain the global economy after the financial crisis from 2007 to 2008, a micro business became the primary business option because of its characteristics such as low capital pressure, low technology threshold and low investment risk. Liu and Hsieh (2011) stated that approximately 60% of all newly established businesses in Taiwan in 2010 were expected to exhibit sustained growth and provide job opportunities within 5 years. In the US, nearly 10% of the labour force opted to start their own businesses, and more than 80% of the job opportunities originated from newly started businesses. In Taiwan, micro businesses are small and medium enterprises (SME) with five or less long-term employees (CDRI, 2010). Schmidt and Kolodinsky (2007) also defined a micro business as an enterprise with five or less long-term employees, and a venture fund of below US$35,000. The MOEA (2013) reported that SMEs in Taiwan reached 1,306,729 in 2012, accounting for 97.67% of the total entrepreneurs in the country. This indicates a 2.11% increase from that in 2011. Sales from SMEs also reached NT$11,381.8 billion in 2012, representing an increase of 1.38% from 2011. SMEs employed a total of 8,484,000 people, which was higher than the people employed in 2011 (1.76% growth rate). This growth rate implies that entrepreneurship has progressed rapidly in Taiwan, and that the influence of micro businesses on the economy and the creation of job opportunities remains vital.
The emergence of the eating-out culture and the diversification of catering has resulted in the popularity of catering micro business as an option. The catering micro business is characterised by low rates of capital pressure, technology threshold and investment risk. This micro business also has a steady market, fair effect and guaranteed income. Wu (2011) defined the catering business as a profit-seeking enterprise offering food and related services. In 2010, the Taiwanese government divided the catering enterprise into independent and franchised businesses (CDRI, 2010). Independent catering businesses refer to restaurants operated by sole proprietorship or partnership. Franchised catering businesses refer to restaurants with joined chain systems having two or more similar members provided with supplies and marketing strategies. Several studies have reported that though Taiwan has approximately 100,000 new entrepreneurs annually, only about 20% of these entrepreneurs remain in business after one year (Lee and Yang, 2013; Chen, 2006; Xu, Wen and Cai, 2006). The catering micro business is confronted with competition from homogenous industries; thus, making it difficult to sustain in a rapidly changing marketing environment. Shih (2009) indicated that micro businesses are mired in small capital, weak physical constitution and power dispersion. Therefore, establishing a micro business does not mean catching up with an upsurge but rather creating the key success factors (KSFs) needed to enable that business to stand out from among competitors.

Gartner (1985) stated that starting a business includes four business starting patterns, namely, business starter, environment, organisation and startup process. Although the startup process is considered essential in starting a business, few studies have discussed the effects of this process on a new business. Therefore, the present study aims to establish a systematic startup process in establishing a business to provide a model for those who desire to start their own businesses. Holt (1992) elaborated that business startups can be divided into pre-startup, startup, early growth and later growth stages; the current study focusses on the pre-startup stage. Interpretive structure modelling (ISM) (Warfield, 1973) is used to derive a systematic process of startups in the pre-startup stage of the catering micro business. ISM can provide concrete frames and systematic operational steps that mitigate possible mistakes and risks during the decision-making process and project implementation (Agarwal, Shankar and Tiwari, 2007; Lin, Chuang and Yin, 2009). ISM results can provide reference materials and operational bases for micro business starters during their early stage of business development. Nonetheless, entrepreneurs must also develop a business plan, including acquiring resources and organising the business, during the pre-startup stage. Business resources are precious and limited during this stage and thus, entrepreneurs must effectively allocate their resources while considering the key factors to become successful. The use of the grey relational analysis (GRA) (Deng, 1989) is a common method to determine KSFs (Lee et al., 2006; Kung, Yan and Lin, 2009; Chen and Chou, 2011). Therefore, GRA is performed to extract the KSFs that can affect the start of a catering micro business. The systematic startup process established in the present study is expected to serve as a model for business starters during the pre-startup stage (preparation stage).

The remainder of this paper is structured as follows: The literature review in Section 2 describes the factors that can affect business startups. Section 3 details the distribution and collection of questionnaires, as well as the analysis of the responses. After obtaining the results, Section 4 compares the results between independent and franchised catering businesses. Section 5 concludes this study.
2 Literature review

Low and MacMillan (1998) suggested that starting a business is similar to creating a new business. Amit and Zott (2001) mentioned that the objective of starting a business is the process of value creation by active initiatives on innovation of entrepreneurs, and by maximising the opportunity to start a business. Tsai, Li and Lin (2007) explained that starting a business is a value-creation activity through the recombination and regeneration of specific resources. Therefore, starting a business is defined as the activity of creating a new business, as well as creating value through innovation and resource recombination.

Table 1 presents the factors that can affect a business startup. Several of the most discussed factors include market segmentation, value positioning and structure of income and costs. Other identified factors include entry barrier and analysis of competitors, establishment of product/service quality control system, product/service innovation, site, demand for professionals, division of responsibilities and work formulation, training and consultation, partners’ related experiences in the target industry, formulation and selection of team members, networks of the team, financing, purchase and price comparisons, and interaction with suppliers and customers. These factors are used to provide a basis in identifying a new business’ pre-startup process.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Definition</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market segmentation</td>
<td>This marketing strategy divides the target market into several different purchase groups, and provides different marketing mixes to match precisely the demand of each group.</td>
<td>Chesbrough and Rosenbloom (2002), Kurtzman and Rifkin (2005), Osterwalder, Piguneur and Tucci (2005), Venter, Wright and Dibb (2015)</td>
</tr>
<tr>
<td>Value positioning</td>
<td>This factor is a combination of a consumer’s cognition, impression and experience related to a certain product as compared with other competitors.</td>
<td>Chesbrough and Rosenbloom (2002), Osterwalder, Piguneur and Tucci (2005), Kotler (1997)</td>
</tr>
<tr>
<td>Entry barriers and analysis of competitors</td>
<td>Entry barriers are entry thresholds of the target market, such as limits of capital, technology, etc. Analysis of competitors is the marketing mix analysis of competitors in the same target market.</td>
<td>Guy (2004), Dollinger (2006), Fatoki (2014)</td>
</tr>
<tr>
<td>Establishment of product/service quality control system</td>
<td>This factor refers to implementing various management activities to guarantee and improve the quality standard of products or services.</td>
<td>Krajewski and Ritzman (2002), Dollinger (2006), Tricker (2014)</td>
</tr>
<tr>
<td>Product/service innovation</td>
<td>Product/service innovation is the new and original action that can provide new or improved products, technologies, or services.</td>
<td>Chandy and Tellis (2000), Krajewski and Ritzman (2002), Classen et al. (2013)</td>
</tr>
<tr>
<td>Site</td>
<td>This factor refers to the decision-making process involved in selecting a site before building both the physical and virtual channels.</td>
<td>Osterwalder, Piguneur and Tucci (2005), Hatten (2015)</td>
</tr>
<tr>
<td>Demand for professionals</td>
<td>This factor refers to business talents such as technology, financial affairs, marketing, etc.</td>
<td>Osterwalder, Piguneur and Tucci (2005), Stringer and Rueff (2014)</td>
</tr>
</tbody>
</table>
Step-by-step process in micro business

Table 1  Classification of factors that affect business startups (continued)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Definition</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Division of responsibilities and work formulation</td>
<td>This factor means everyone has an assigned task; thus, the division of functions and responsibilities and the formulation of work are required.</td>
<td>Dollinger (2006), Hatten (2015)</td>
</tr>
<tr>
<td>Training and consultation</td>
<td>Enterprises can seek the assistance of external experts to answer questions or provide consultation; training of employees can be developed to enhance their knowledge, skills, attitudes and problem-solving abilities.</td>
<td>Lussier (1995), Dollinger (2006)</td>
</tr>
<tr>
<td>Partners’ related experiences in the target industry</td>
<td>Partners’ related experiences in starting a business, such as working experience in the past, knowledge, technology, etc.</td>
<td>Hoad and Rosko (1964), Cheung and Chow (2006), Kim and Vonortas (2014)</td>
</tr>
<tr>
<td>Formulation and selection of team members in a business startup</td>
<td>The members of the entrepreneurial team, that is, the partners in starting a business.</td>
<td>Kurtzman and Rifkin (2005)</td>
</tr>
<tr>
<td>Networks of the team</td>
<td>The connections of the entrepreneurial team.</td>
<td>Osterwalder, Piguenue and Tucci (2005), Dollinger (2006)</td>
</tr>
<tr>
<td>Structure of income and costs</td>
<td>Analysing the proportion of income and expenses to total income, as well as the total cost, to determine the characteristics of both income and expenses.</td>
<td>Mahadevan (2000), Chesbrough and Rosenbloom (2002), Osterwalder, Piguenue and Tucci (2005)</td>
</tr>
<tr>
<td>Financing</td>
<td>The process of collecting the capital.</td>
<td>Nofsinge and Wang (2011)</td>
</tr>
<tr>
<td>Purchase and price comparisons</td>
<td>Purchase is implemented based on price quotations’ comparison from upstream suppliers.</td>
<td>Fang (2000), Dollinger (2006)</td>
</tr>
<tr>
<td>Interaction with Suppliers</td>
<td>This factor refers to maintaining positive relationships with suppliers that provide businesses with products or services.</td>
<td>Fu (2010)</td>
</tr>
<tr>
<td>Interaction with customers</td>
<td>The continuous relationship of marketing. Through the definition of the value of different customer groups, various marketing mix can be planned to satisfy the customers. Communication with customers aids in understanding their demand; the marketing strategy can be adjusted with the change in consumer behaviour.</td>
<td>Hamel (2000), Fu (2010)</td>
</tr>
</tbody>
</table>

3  Methodology

The research approach is presented and discussed in this section along with the data collection and analysis procedures.
3.1 Approach

A survey research was conducted to determine KSFs in the pre-startup stage and the systematic process of a catering micro business. The questionnaire items were developed based on the factors identified in Table 1. The respondents were asked to rate each statement of the questionnaire using a five-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree) to analyze KSFs in a catering micro business’ start-up stage. The higher the score, the more emphasis is placed by the respondents on the particular questionnaire item and vice versa. Next, GRA was used to extract KSFs in a catering micro business’ pre-startup stage. Finally, ISM was used to establish the pre-startup process of a catering micro business.

3.2 Data collection and analysis

The respondents of this study were individuals who had started or were about to start their catering businesses. The questionnaires that aimed to derive the experiences of starting catering businesses were distributed through e-mail. A total of 53 valid questionnaires were collected (30 valid questionnaires were from independent catering businesses and 23 from franchised catering businesses).

3.2.1 Grey relational analysis

Collected data were analysed using GRA to extract KSFs in a catering micro business’ pre-startup stage. These factors provide reference materials for business starters with limited resources. GRA was performed in three steps. First, the grey relational coefficient was calculated based on Eq. (1).

\[
\rho(x_i(k),x_j(k)) = \frac{\min_{k} \min_{j} |x_i(k) - x_j(k)| + \zeta \max_{k} \max_{j} |x_i(k) - x_j(k)|}{\max_{k} \max_{j} |x_i(k) - x_j(k)|}
\]

where \(\zeta\) is the identification coefficient and is equal to 0.5, \(x_0(k)\) is the target sequence and \(x_i(k)\) is the comparison sequences. A five-point Likert scale was used to evaluate the criteria for calculating the grey relational coefficients of all factors; the highest score was 5. Therefore, \(x_0(k) = 5\). Each factor was also rated with a score of 5, 4, 3, 2 or 1. Thus, \(x_i(k)\) is the score that the \(k\)th respondent answers to factor \(i\), where \(i = 1, 2, \ldots, 17;\) \(k = 1, 2, \ldots, n\); and \(n\) is the number of valid questionnaires.

Second, Eq. (2) shows that the grey relational degree is equal to the arithmetic mean of the grey relational coefficients.

\[
r(x_0, x_i) = \frac{1}{n} \sum_{k=1}^{n} \rho(x_0(k), x(k))
\]

The grey relational degree represents the relationship between the target and comparison sequences. If the change in the two factors has the same trend, then the extent of both synchronous change and correlation is high. A factor with a high grey relational degree is considered relatively important in influencing the startup of catering micro businesses. Finally, the obtained grey relational degrees are arranged from large to small values to determine the grey relational sequence. Factors with similar grey relational degrees are classified (or organised) in the same group.
3.2.2 ISM analysis

Data were analysed using ISM to establish the pre-startup process of a catering micro business. Table 1 shows that with \( q_i \) as the \( i \)th factor affecting the startup of a catering micro business, \( i = 1, 2, \ldots, k \) and \( k = 17 \). The implementation steps of ISM (Lin, 2009; Liu, 2010) are presented as follows:

**Step 1:** The affiliation of two factors was established based on the responses to the questionnaire. No unified standard to recognise the affiliation of each factor in using the research questionnaire was available. Hsieh, Huang and Liu (2007) explained that ‘0’ is ranked as no effect if 60% or less respondents recognised a pair of factors, while ‘1’ is ranked as with effect if more than 60% of the respondents recognised a pair of factors. Wu, Xu and Dai (2011) acknowledged the affiliation of two factors if over 50% of the respondents indicated the aforementioned affiliation of the factors. In the present study, we tested the standard on 60, 70, 80 and 90% of the respondents who regarded the factors in the same pair as affiliated. The testing results indicated that setting the standard at 60 or 70% placed all 17 factors in the same stage; thus, identifying the prioritisation of the factors was impossible. A standard of 80% provided clear affiliations of the factors, as well as the identification of the factors’ prioritisation. Upon the examination of the factors in three to four business starting stages, the results can be used as reference by people concerned. A 90% standard indicated numerous factors without any affiliation, and which are not shown in the results. The remaining factors’ prioritisation can be calculated, but their number was considerably small because the range was limited. Therefore, the standard was set at 80%.

**Step 2:** The pairwise factors are as follows. (1) If Factor \( i \) influences Factor \( j \) directly, then \( a_{ij} = 1 \) and \( a_{ji} = 0 \); (2) if Factor \( j \) influences Factor \( i \) directly, then \( a_{ij} = 0 \) and \( a_{ji} = 1 \); (3) if Factors \( i \) and \( j \) influence each other, then \( a_{ij} = 1 \) and \( a_{ji} = 1 \); and (4) if Factors \( i \) and \( j \) have no influence on each other, then \( a_{ij} = 0 \) and \( a_{ji} = 0 \). Therefore, the relation matrix \( (R) \) can be shown as \( R = [a_{ij}] \), where \( a_{ij} \) is the element on the \( i \)th row and \( j \)th column of matrix \( R \).

**Step 3:** The adjacent matrix \( (A) \) based on the relation \( (R) \) and identity \( (I) \) matrices was determined.

**Step 4:** The adjacent matrix was changed into the reachable matrix based on transitivity. Transitivity states that if Factor \( i \) is related to Factor \( j \) and Factor \( j \) is related to Factor \( k \), then Factor \( i \) is necessarily related to Factor \( k \).

**Step 5:** The reachable matrix was changed into the hierarchy matrix based on reachability, antecedent and common sets. The reachability set of Factor \( i \) \( (R(a_i)) \) can be obtained by examining all columns of the elements marked ‘1’ on the \( i \)th row of the reachable matrix. The antecedent set of Factor \( i \) \( (A(a_i)) \) can be obtained by examining all rows of the elements marked ‘1’ on the \( i \)th column of the reachable matrix. The common set of Factor \( i \) is the intersection of sets \( R((a_i)) \) and \( A((a_i)) \).

**Step 6:** The ISM relational hierarchy graph of starting a catering business was drawn based on the hierarchy matrix. If the elements of sets \( (R(a_i)) \) and \( (R(a_i) \cap A(a_i)) \) are the same, then the corresponding factors are selected as the first layer in the ISM relational hierarchy graph; the corresponding rows and columns of the reachable matrix are then deleted. Consequently, a new reachable matrix can be obtained.
Step 7: Steps 5 and 6 were repeated until all factors are selected.

The ISM relational hierarchy group of starting a catering business can structure complex issues to form interpretable and systematic patterns. This systematic startup process can serve as a model for business starters during their pre-startup stage (preparation stage).

4 Analysis of results

In this section, the KSFs in the pre-startup stage of a catering micro business are extracted based on the questionnaire responses. Subsequently, the pre-startup process of a catering micro business is established. Finally, independent and franchise micro businesses are compared.

4.1 Extraction of KSFs by GRA

The grey relational degrees of KSFs of independent and franchised catering businesses were calculated using Eqs. (1) and (2); Table 2 shows the calculations. The factors marked ‘∗’ in Table 2 are KSFs. These extracted factors affect independent and franchised catering businesses during the pre-startup stage, and ought to be assessed carefully, and the invested resources ought to be increased.

Table 2 Order of grey relational degrees

<table>
<thead>
<tr>
<th>Number of factor</th>
<th>Independent catering business</th>
<th>Franchise catering business</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Grey relational degree</td>
<td>Order of grey relation</td>
</tr>
<tr>
<td>1</td>
<td>0.7647∗</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>0.7255</td>
<td>13</td>
</tr>
<tr>
<td>3</td>
<td>0.7289</td>
<td>9</td>
</tr>
<tr>
<td>4</td>
<td>0.7059</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>0.7154</td>
<td>11</td>
</tr>
<tr>
<td>6</td>
<td>0.7389</td>
<td>7</td>
</tr>
<tr>
<td>7</td>
<td>0.6661∗</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>0.6616</td>
<td>14</td>
</tr>
<tr>
<td>9</td>
<td>0.6930</td>
<td>12</td>
</tr>
<tr>
<td>10</td>
<td>0.5490</td>
<td>15</td>
</tr>
<tr>
<td>11</td>
<td>0.5863</td>
<td>10</td>
</tr>
<tr>
<td>12</td>
<td>0.6510</td>
<td>16</td>
</tr>
<tr>
<td>13</td>
<td>0.7392∗</td>
<td>4</td>
</tr>
<tr>
<td>14</td>
<td>0.6569∗</td>
<td>2</td>
</tr>
<tr>
<td>15</td>
<td>0.6765</td>
<td>8</td>
</tr>
<tr>
<td>16</td>
<td>0.6608</td>
<td>17</td>
</tr>
<tr>
<td>17</td>
<td>0.9020∗</td>
<td>1</td>
</tr>
</tbody>
</table>

*Key Success Factor (KSF)

Note: Please see Table 1 for the number of each factor
4.2 Establishment of pre-startup process for micro business by ISM

The ISM implementation steps for an independent catering business are as follows:

**Step 1:** Determining the affiliation of the pairwise factors

At a standard of 80%, the affiliation of the two factors was established if 24 respondents (24/30 = 80%, 30 valid questionnaires) recognised a pair of factors as ‘↔’ for independent catering business, where ‘↔’ indicates that the pairwise factors influenced each other and ‘→’ indicates that Factor $i$ is related to Factor $j$. Table 3 shows the result.

Table 3  Affiliation of the pairwise factors for independent catering business

<table>
<thead>
<tr>
<th>Relation</th>
<th>1↔2</th>
<th>1↔3</th>
<th>1↔5</th>
<th>1→6</th>
<th>1→7</th>
<th>1→13</th>
<th>1↔17</th>
<th>2↔5</th>
<th>2→7</th>
</tr>
</thead>
<tbody>
<tr>
<td>2↔9</td>
<td>2↔13</td>
<td>4→1</td>
<td>4↔5</td>
<td>4→13</td>
<td>5→3</td>
<td>5→7</td>
<td>5→8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5→10</td>
<td>5→17</td>
<td>10→7</td>
<td>10→11</td>
<td>13→14</td>
<td>13↔15</td>
<td>15→16</td>
<td>16→13</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Remarks: Number of factor refers to Table 1

**Step 2:** Determining the relation matrix

Based on the results in Table 3, the relation matrix ($R$) for independent catering business was obtained and shown in Eq. (3), where ‘1’ represents the related pairwise factors and ‘0’ represents the unrelated pairwise factors.

$$
R = \begin{bmatrix}
1 & 1 & 0 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 1 \\
1 & 0 & 0 & 1 & 0 & 1 & 0 & 1 & 0 & 0 & 0 & 1 & 0 & 0 & 1 \\
1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
1 & 1 & 1 & 1 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 1 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 1 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{bmatrix}
$$

**Step 3:** Determining the adjacent matrix

In Eq. (4), the adjacent matrix ($A$) for independent catering business is the sum of relation ($R$) and identity ($I$) matrices.

**Step 4:** Determining the reachable matrix

In Eq. (4), $a_{15} = 1$ and $a_{54} = 1$ mean that Factor 1 is related to Factor 5 and Factor 5 is related to Factor 4. Therefore, $a_{14} = 1$ is obtained based on transitivity, which implies a
relationship between Factors 1 and 4. The result, which is the reachable matrix (T), is shown in Eq. (5), where the "*" mark means that the pairwise factors conform to the transitivity.

\[
A = \begin{bmatrix}
1 & 1 & 1 & 0 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 1 \\
1 & 1 & 0 & 0 & 1 & 0 & 1 & 0 & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 1 \\
1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
1 & 0 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 \\
1 & 1 & 1 & 1 & 0 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 \\
0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\end{bmatrix}
\]

\[
T = \begin{bmatrix}
1 & 1 & 1 & l' & 1 & 1 & 1 & l' & l' & l'' & 0 & 0 & 1 & l'' & l' & 0 & 1 \\
1 & 1 & l'' & l' & 1 & l'' & 1 & l'' & l' & 0 & 0 & 1 & l'' & l' & 0 & 1 \\
1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
1 & l'' & l' & 1 & l'' & l' & l'' & l' & 0 & 0 & 1 & l'' & l' & 0 & 1 \\
1 & 1 & 1 & 1 & 1 & l'' & 1 & 1 & 1 & l'' & 0 & 1 & l'' & 0 & 0 & 1 \\
0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
\end{bmatrix}
\]

\[
(4)
\]

\[
(5)
\]
Step 5: Determining the hierarchy matrix

Table 4 shows the hierarchy matrix. In Table 4, the first column is the number of factors, and the second, third and fourth columns are the reachability set, the antecedent set and the common set, respectively. For example,

**Table 4**  Hierarchy matrix for independent catering business

<table>
<thead>
<tr>
<th>No</th>
<th>Reachability set</th>
<th>Antecedent set</th>
<th>Common set</th>
</tr>
</thead>
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<tr>
<td>1</td>
<td>1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 13, 14, 15, 17</td>
<td>1, 2, 3, 4, 5, 10, 13, 17</td>
<td>1, 2, 3, 4, 5, 10, 13, 17</td>
</tr>
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<td>1, 2, 4, 5, 10, 13, 15, 16, 17</td>
<td>1, 2, 4, 5, 10, 13, 15, 17</td>
</tr>
<tr>
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<td>1, 2, 3, 4, 5, 10, 17</td>
<td>1, 3</td>
</tr>
<tr>
<td>4</td>
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<td>1, 2, 4, 5, 10</td>
<td>1, 2, 4, 5, 10</td>
</tr>
<tr>
<td>5</td>
<td>1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 17</td>
<td>1, 2, 4, 5, 10, 13, 17</td>
<td>1, 2, 4, 5, 10, 13, 17</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>1, 2, 4, 5, 6, 17</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>7</td>
<td>1, 2, 4, 5, 7, 10, 13, 17</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>8</td>
<td>1, 2, 4, 5, 8, 10</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>9</td>
<td>1, 2, 4, 5, 9, 10, 13, 17</td>
<td>9</td>
</tr>
<tr>
<td>10</td>
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<td>1, 2, 4, 5, 10</td>
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<tr>
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<td>5, 10, 11</td>
<td>11</td>
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<tr>
<td>12</td>
<td>12</td>
<td>12</td>
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</tr>
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<td>1, 2, 5, 7, 9, 13, 14, 15, 16, 17</td>
<td>1, 2, 4, 5, 13, 15, 16, 17</td>
<td>1, 2, 5, 13, 15, 16, 17</td>
</tr>
<tr>
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<td>14</td>
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<td>14</td>
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<tr>
<td>15</td>
<td>2, 13, 14, 15, 16</td>
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<td>2, 13, 15, 16</td>
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<tr>
<td>16</td>
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<td>13, 15, 16</td>
<td>13, 15, 16</td>
</tr>
<tr>
<td>17</td>
<td>1, 2, 3, 5, 6, 7, 9, 15, 17</td>
<td>1, 2, 4, 5, 10, 13, 17</td>
<td>1, 2, 5, 17</td>
</tr>
</tbody>
</table>

Remarks: Number of factors refers to Table 1

1. The reachability set of Factor 1 is $R(a_1) = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 13, 14, 15, 17\}$: the elements marked ‘1’ for Factor 1 on the first row of the reachable matrix in Eq. (5) are Columns 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 13, 14, 15 and 17. Therefore, the reachability set of Factor 1 is $R(a_1) = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 13, 14, 15, 17\}$.

2. The antecedent set of Factor 1 is $A(a_1) = \{1, 2, 3, 4, 5, 10, 13, 17\}$: the elements marked ‘1’ on the first column of the reachable matrix in Eq. (5) are Rows 1, 2, 3, 4, 5, 10, 13 and 17. Therefore, the antecedent set of Factor 1 is $A(a_1) = \{1, 2, 3, 4, 5, 10, 13, 17\}$.

3. The common set of Factor 1 is $R(a_1) \cap A(a_1) = \{1, 2, 3, 4, 5, 10, 13, 17\}$: the common set of Factor 1 is the intersection of sets $R(a_1)$ and $A(a_1)$; thus, $R(a_1) \cap A(a_1) = \{1, 2, 3, 4, 5, 10, 13, 17\}$. 

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The reachability, antecedent and common sets of other factors can be analysed in the same manner.

**Step 6**: Drawing the ISM relational hierarchy graph

Based on the hierarchy matrix in Table 4, the reachability and common sets of Factors 3, 6, 7, 8, 9, 11, 12 and 14 are the same. Therefore, these factors are selected as the first layer in the ISM relational hierarchy graph. Subsequently, the elements on the 3rd, 6th, 7th, 8th, 9th, 11th, 12th and 14th rows and those on the 3rd, 6th, 7th, 8th, 9th, 11th, 12th and 14th columns of the reachable matrix are deleted and a new reachable matrix is established. Therefore, new reachability \((R(ai))\), antecedent \((A(ai))\) and common \((R(ai) \cap A(ai))\) sets are established based on the new reachable matrix. The factors in the second layer in the ISM relational hierarchy graph can then be selected if their reachability and common sets are the same.

**Step 7**: The procedure is repeated until all factors are selected.

Figure 1 shows the ISM relational hierarchy graph of starting an independent catering business and illustrates the ISM results. Figure 1 also illustrates that if Factor \(i\) affects Factor \(j\), then \(i \rightarrow j\). If Factors \(i\) and \(j\) influence each other, then \(i \leftrightarrow j\). Moreover, Figure 1 suggests that in the pre-startup process, respondents who started an independent catering business considered ‘related experiences of partners in the target industry’ and ‘establishment of product/service quality control system’ essential during Stage 1. Business starters ought to first recall if their previous related experiences in the target industry are useful, and then accumulate these related experiences and use them as references. The questionnaire results also showed that specific products or services are already selected prior to the pre-startup stage. Therefore, a product/service quality control system ought to be established during Stage 1 to maintain the quality of their products or services.

**Figure 1** ISM relational hierarchy of starting independent catering business

During Stage 2, ‘market segmentation’ is affected by the ‘establishment of product/service quality control system’ from Stage 1. This situation means that business starters conduct market segmentation or establish the quality standard in segmenting the market after the development of a product/service quality control system. In the second stage, business starters ought to consider interaction channels with their customers,
strategies in selling their products/services and establishing connection with suppliers. During Stage 3, ‘value positioning’ is affected by ‘market segmentation’ and ‘interaction with customers’ that occurred in the previous stage. This condition indicates that independent catering business starters ought to consider market segmentation and customer interaction channels in the previous stage to determine the value and position of their business in the industry. Business starters must also consider the innovation of their products or services to improve former products or services. They ought to also be familiar with their income structures and costs during Stage 3 to predict their volume of sales and costs, as well as to determine the highest prices they can pay for their products or raw materials. In Stage 4, business starters have to analyse the entry barriers of their chosen market, investigate their competitors and develop competition contingency measures such as lowering of prices to promote sales volume or product/service differentiation. Business starters must also search for the proper location, both physical and online channels, for their customers to purchase their products/services. Business starters have to seek competent team members during this stage, consider their demand for professionals, divide their responsibilities and delegate tasks to employed professionals to acquire technical competency rapidly. Business starters can also apply for government assistance or consult experts to understand the content of related training. Through these efforts, business starters can improve their target industry.

ISM relational hierarchy group of starting franchised catering businesses can be obtained in a similar manner and are presented in Figure 2. Figure 2 also shows that the respondents who started a franchised catering business considered ‘networks of team members’ essential in Stage 1 of the pre-startup process. Therefore, entrepreneurs who aim to enter the catering industry through affiliation ought to expand their social networks and obtain beneficial franchise information through different channels such as participating in franchise exhibitions and seminars, as well as visiting industry-related upstream and downstream companies. The franchise system has standard affiliation conditions and contents, as well as golden stores, franchise fee deals and other related methods. In the absence of a specific channel to obtain related information, other franchisees can use pre-emptive opportunities as related information is released. Therefore, entrepreneurs who want to enter the catering trade ought to first establish an industry-related social network.

Figure 2  ISM relational hierarchy of starting franchised catering business
Factors during Stage 2 include ‘market segmentation,’ ‘value positioning,’ ‘product/service innovation,’ ‘structure of income and costs’ and ‘interaction with customers.’ In this stage, market segmentation and value positioning ought to be considered, the target consumer defined and the method to interact with consumers be conceived. Moreover, entrepreneurs who want to enter the catering trade as franchisees ought to consider the independence of innovation of the products/services and understand the expected sales amount, franchise fee and other operating costs to determine whether the target enterprise is sufficiently profitable to join.

Factors during Stage 3 include ‘location selection,’ ‘demand for professionals,’ ‘consulting and training,’ ‘related experience of team members in the target industry’ and ‘interaction with suppliers.’ These factors suggest that entrepreneurs who want to enter the catering trade ought to negotiate with the target enterprise on franchise matters in Stage 3; they could acquire education, training and professional advice from the target enterprise to assimilate the necessary related knowledge. With education, training, advice and related past experiences, entrepreneurs can determine the essential professional skills to start a business. Thereafter, they can start selecting the location of their store and interact with suppliers to confirm the sources and quality of materials.

Factors during Stage 4 include ‘analysis of market entry barriers and competitors,’ ‘establishment of product/service quality system’ ‘division of powers and work formulation’ ‘number and selection of team members to start a business,’ ‘financing’ and ‘purchases and price comparisons.’ In this stage, analyses of market entry barriers and competitors in the selected market are conducted to identify barriers and construct contingency measures such as price reduction when competitors enforce a markdown sale, or using the advantages of competing with different products/services. A product/service quality control system ought to also be established. Apart from the stipulations of a franchise enterprise, the powers of professionals and formulation of their works can be achieved through consulting and training if several elastic regulations allow a franchise to formulate standards independently or under established quality standards. Consequently, a franchised enterprise can develop standards with enhanced accuracy and refinement to ensure consistency of the products/services. Decision making and discussions can be eased by considering the scale of the team and assessing the number of people required as well as the suitability of each person under the premise of a professional division. Therefore, franchise enterprises ought to realise the stipulation to use a set of agreed-upon suppliers for purchasing. In the absence of such provision, these enterprises can self-wholesale and compare prices and supplies. In financing, the required finances ought to be calculated and the financial resources and payments balanced. The application of funds also ought to be planned.

4.3 Comparison of results between starting independent and franchised catering businesses

The results of starting independent and franchised catering businesses by GRA and ISM are compared in this section.

4.3.1 Comparison of results by GRA

The KSFs shared by independent and franchised catering business starters are ‘market segmentation,’ ‘structures of income and costs’ and ‘interaction with customers.’ These
results indicate that the respondents consider the following KSFs during the pre-startup stage: investing resources and time in investigating the market, determining the manner of interaction with customers and method of providing them with products/services, calculating operating costs and ratio of non-operating costs to the estimated sales revenue and reflecting on worthy investments in the target market.

In terms of divergent KSFs for starting independent and franchised catering businesses, we individually explain the emphasised factors for each type of catering business. Independent catering business starters emphasised the ‘demand for professionals’ and ‘financing.’ Franchised catering businesses demonstrated less demand for professionals than the independent one’s businesses because of the transparent and standardised operation flow of the former, making it easier for a franchisee to follow. Franchised catering business starters have to pay franchise fees periodically, whereas independent catering business starters require stable financing and expansion. Therefore, independent catering business starters must plan for the channels and volume of financing beforehand to facilitate the fund turnover when deemed necessary in starting their businesses. Franchise catering business starters focus on ‘value positioning,’ ‘analysis of market entry barriers and of competitors,’ and ‘location selection.’ For franchised catering business starters, the available funds and assessment of the franchise system are extremely important because these factors determine ‘value positioning.’ These catering business starters consider franchise fees, conditions and competitors components of the ‘analysis of market entry barriers and of competitors.’ Therefore, location selection conditions such as the absence of franchise branches up to 100 m nearby and positioning at crossroads or corners are mandatory.

4.3.2 Comparison of results by ISM

The comparison of ISM results between independent and franchised catering businesses is limited to Stage 1. Factors that ought to be considered by independent catering businesses during Stage 1 are ‘establishment of a product/service quality control system’ and ‘related experiences of team members in the target industries.’ The reason for considering these factors is that a proper quality control system ought to be established during the pre-startup stage to ensure the sources and quality of food, as well as to obtain bases for future market segmentation and value positioning. The related experiences in the target industries can also facilitate opportunities and development.

The factor that ought to be considered by franchised catering business starters in Stage 1 is ‘networks of team members.’ This factor is not shown in the business starting process graph for independent catering business because franchised catering business starters require background information from networks, such as suitable location and favourable terms, to serve as basis in selecting the franchise enterprises. After acquiring the franchise, franchised catering business starters do not maximise their networks by obtaining feedback or customer referrals because they only need to follow the franchise enterprises’ terms and regulations. By contrast, independent catering business starters do not follow any terms or regulations. Instead, they depend on their networks, including customers, upstream and downstream suppliers, and business competitors, to obtain pertinent information during the entire business starting process. They can also develop new products, gather potential customers and formulate marketing strategies through their networks. Therefore, although the ‘networks of team members’ factor has no affiliation with other factors in the independent catering business starting process,
this factor plays an important facilitating role in the pre-startup process by enabling business starters to obtain information.

5 Conclusion

This study aimed to propose a systematic process in the pre-startup stage of independent and franchised catering businesses. GRA was performed to extract KSFs, whereas ISM was used to establish the pre-startup process. Results showed that KSFs (GRA) and the pre-startup process (ISM) differ between the two types of catering businesses. Therefore, prior to starting the business, the business starters ought to determine which industry they aim to operate, and to identify the KSFs and processes relative to the type, thereby using the information as a reference and lengthening the duration of their business.

This study can assist in establishing pre-startup steps for those who aspire to start a micro business. However, the focus of the current study is on the catering micro business and thus, this study may not be applicable to other types of businesses. Results may also vary on a case-to-case basis. Various micro businesses in different industries can benefit from this study. This study could also influence other micro businesses in other industries in the future. Further studies can contribute to the completion of this study and provide further reference materials for business starters; however, the results obtained may differ from one another.

References


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