African Journal of Business Management Vol. 5(16), pp. 6901-6916, 18 August, 2011
Available online at http://www.academicjournals.org/AJBM
DOI: 10.5897/AJBM10.701
ISSN 1993-8233 ©2011 Academic Journals

Full Length Research Paper

A study of the key success factor of the operational performance of theme park

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Accepted 24 September, 2010

This study focused on theme park industry using the balanced scorecard developed by Kaplan and Norton (1992) and referred to past literatures to sort out related strategic factors to build the fundamental structure of the research. Through the fuzzy Delphi method and the fuzzy analytic hierarchy process, the key success factors for improving theme park's operational performance were extracted. Finally, the strategic blueprint used for improving the theme park's operational performance was carefully formulated regarding the key success factors. Results were provided as references to future development of government policies regarding theme park, and it assisted theme operators in increasing operational performance and in sustaining competitive advantages.

Key words: Theme park, balanced scorecard, fuzzy Delphi method, fuzzy analytic hierarchy process, key success factors.

INTRODUCTION

With the development of the travel and leisure industry of Taiwan, traveling prerogatives have expanded with rich diversity. Since government-operated tourist spots are no longer able to satisfy public demand, people have resorted to private theme parks as their traveling destination. Currently, many business owners have invested in the theme park industry, creating unprecedented competition in the field. Aaker (1984) has suggested that competitive advantages could only be sustained by embracing key success factors (KSFs) to increase operational performance.

For managers, financial indices are usually indicators for evaluating the operational performance of a company. However, this metric is limited only to the measurement of tangible assets and is incapable of determining intangible assets crucial in service industry, such as customer satisfaction or employee unity. In an era with advanced information technology, businesses mainly use these intangible assets as competitive advantages, profits, and even foundation for expansion. The value creation and competitive bases of an organization have shifted from tangible to intangible assets.

Kaplan and Norton (1992) have indicated that key performance indicators of tangible assets are unable to follow the changes of time. Therefore, Kaplan and Norton (1992) have proposed the "Balanced Scorecard" performance indicator. The balanced scorecard (BSC) is able to interpret the mission and strategy of an organization and transform them into substantial objectives for evaluation. The scorecard represents the balanced situation between the external and internal environments of an organization; it evaluates the external environment for clients and shareholders, and simultaneously focuses on internal evaluation, including operational processes, innovational abilities, training and growth. Furthermore, the operational performance of theme parks is affected by multiple factors and extensive layers. If such factors can be induced and sorted out in accordance with the dimensions of a hierarchy framework, the work can be simplified, and the results can be used as reference for making decisions. At the same time, since the fuzziness and uncertainty of human thought can be further expressed, this paper has adopted the fuzzy Delphi method and fuzzy analytic hierarchy process (FAHP) to increase the accuracy of the findings (Lee, 2008; Lee and Hsu, 2008). Fuzzy Delphi method is used to improve the problems faced by traditional Delphi method, and the

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bi-triangular fuzzy arithmetic is used to integrate the advice of experts and then test the convergent effect recognized by experts via “gray zone test method”, although the bi-triangular fuzzy number obtained from the fuzzy Delphi method can help avoid the opinion of the minority. More-over, the advantages of FAHP is that experts need to fill only one definite value when making paired comparison without falling into the dilemma of not knowing how to specify the fuzzy number or the need for understanding its definition. Additionally, the triangular fuzzy number obtained from fuzzy Delphi method can avoid the minority’s opinion. At first, consistency could be verified by the definite value specified by experts to determine the appropriateness of the questionnaire. Then, it can be converted to a fuzzy number to avoid direct use of fuzzy numbers to calculate the consistency and cause low consistency.

In conclusion, theme parks are taken as the research subject of this article. Based on Kaplan and Norton (1992), four sections of BSC, fuzzy Delphi method, FAHP and KSFs (which could raise the operational performance of theme parks) are extracted, and strategic blueprints are constructed. Through the KSFs, managers can better build theme parks with competitive advantages.

LITERATURE REVIEW

Theme park

Walt Disney constructed the first theme park in California (USA) in 1955. Consequently, several nations have built parks that correspond to their national characters. Wylson and Wylson (1994) have explained that theme parks are playgrounds constructed based on topics such as science, culture or history. The facilities are man-made structures utilizing simulation. With modern technology and skills, visitors are able to experience a series of visual and audio stimulation within the main attractions. Crossley and Jamieson (1998) have pointed out that a theme park is a family-oriented entertainment area with specific topics. The park is constructed with conceptualized large buildings that accommodate amusement facilities, performers, and featured stores. From these scholars’ points of view, the research defines “theme park” as a setting meant to create landscape, facilities, and atmosphere with unique themes to stimulate relative feelings associated with such themes and to allow visitors to rest and retreat physically and psychologically; that is, a respite away from their everyday lives.

Balanced scorecard (BSC)

Kaplan and Norton (1992) have proposed the use of BSC as a performance management system to translate strategies into tangible targets and measurements. BSC is a tool that interprets the missions, visions and strategies of an organization, and translates them into tangible goals and targets that serve as a strategic measurement and management system (Kaplan and Norton, 1996). Pinero (2002) pointed out that the BSC can be used to measure the intangible assets or intellectual capital, in that it is a comprehensive performance measurement system. This strategic management tool consists of financial, customer and internal business processes, as well as learning/growth dimensions:

1. Financial dimension: The financial dimension reflects past performance and indicates whether the implementation of corporate strategies contribute to profits. The targets and measurements of other dimensions of the BSC are eventually linked with one or more targets of financial dimensions. All the strategies, projects, and action plans should be geared to help companies achieve their financial targets as long-term pursuits.
2. Customer dimension: Kaplan and Norton (1996) have proposed the customer dimension for the BSC by identifying the directions of targeted customer and market segmentations. These segmentations represent the sources of revenue for companies to achieve their financial targets. Once the market segmentations have been identified and selected, companies set up targets and measurements surrounding these targeted segmentations.
3. Internal business processes dimension: Kaplan and Norton (1996) have suggested that prior to the design of performance indicators for corporate internal business processes, a value chain analysis should be conducted to improve the existing operational workflow and meet the targets in financial and customer dimensions. This helps to establish a value chain of internal processes to meet present and future demands.
4. Learning/growth dimension: This dimension leads to the progress and development of an organization in the long run, confirming the prerequisite foundation and structure an organization has to establish. The targets in the learning/growth dimension serve as a foundation and structure for the grand goals of the other three dimensions, as well as the driving force for these three dimensions to achieve excellent outcomes. Most companies refer to the outcome measurements of the other three dimensions to derive the goals for employees in learning/growth dimension. The driving factors of specific situations are used to supplement the core outcome measurements.

Kaplan and Norton (1992) have proposed that through BSC, high-level managers could focus corporation strategies on few crucial performance indicators to increase the operational performance of a company. Denton and White (2000) have found that after the implementation of the BSC, the target achievement rates are higher as compared to those prior to the implementation. Managers are more able to understand their expected

long-term goals, which help improve operating efficiency. Meanwhile, Davis and Albright (2004) have pointed out that the implementation of the BSC enables companies to create more value because of the links between financial and non-financial performances. Lee et al. (2006) used the BSC and FAHP to study the contribution of IT department in the organization. Lee and Hsu (2008) used the BSC, fuzzy Delphi method and FAHP to investigate the impact of leisure farm performance of key success factors. Therefore, this paper uses the BSC to explore the contribution of information department to the organization as a whole. Table 1 summarizes the characteristics of the theme park industry, which serves as a reference for the determination of the initial hierarchy planning in order to facilitate subsequent empirical research.

Key success factor (KSF)

Daniel (1961) has indicated that the KSF is an important task that a business must manage particularly well in order to be successful. Rockart (1979) has pointed out that for any business, certain key areas need proper execution for the business to have outstanding competitive performance. Aaker (1984) has pointed out that KSFs represent the most important competitive abilities or competitive assets of a company. When a successful organization owns more advantages relative to its competitors, the advantages must be KSFs. An unsuccessful organization usually lacks one or several KSFs and is thus unable to elaborate its competitive advantages and success. According to Ohmae (1985), the KSF is a method used to find strategic advantages. A business should concentrate its resources in specific fields to gain competitive advantages. According to Thompson and Strickland (2002), the KSFs of an industry are related to product property, capital, competitive advantage and market acquisition, and that these have a close relationship with net sales. The KSF is a necessary element for all members of an industry who want greater competitiveness. Concluding from the opinion of different scholars regarding KSFs, a KSF acts as an important consideration for industrial analysis and management. Hence, a business could gain consistent competitive advantages and sustainability in an industry.

KSFs change over time across markets and along with the development of industries. For managers, the first important task is to identify the KSFs for their industry and dedicate its limited resources into the critical areas in order to establish competitive advantages. The factor analysis, the Delphi method, the case study and the hierarchical analysis can be used to screen out KSF (Saaty, 1980; Bullen and Rockart, 1981; Hofer and Schendel, 1985). As this paper adopts an expert questionnaire survey, the traditional Delphi method and hierarchical analysis seems to leave room for fuzziness in terms of the averages, attribute correlation for decision making, collective decisions, and inaccuracy (Hwang and Lin, 1987; Hsu, 1998; Chen, 2002). Hwang and Lin (1987), Ishikawa et al. (1993), Hsu (1998) and Chen (2002) pointed out that when solving the problems of group consensus decision-making, the introduction of fuzzy Delphi method and fuzzy hierarchical analysis has the following advantages: (1) survey time and cost are saved; (2) experts' advices are fully expressed; (3) the fact that only 50% information can be provided in traditional Delphi method can be improved, and the fuzziness and uncertainty of human thought can be fully expressed; (4) the set-up procedure of fuzzy number is simple and easy to understand; (5) the fuzzy hierarchical analysis can help one to get acquainted with the reversion of the plan; and (6) the counting process is simple, and also capable of dealing with multiple-hierarchical, multiple-property and multiple-plan decision-making problems.

This paper utilizes the fuzzy Delphi method and FAHP to analyze data and handle the fuzziness issues in the process of criteria measurement and judgment. This helps in the selection of KSFs to improve the operating efficiency of theme parks. The detailed calculation processes of the fuzzy Delphi method and FAHP are explained in the section dedicated to analytical methods.

Determination of the hierarchical structure

This paper adopts the viewpoints of Kaplan and Norton (1992) regarding the BSC, referring to the literature and suggestions from various scholars (Table 1) in the determination of the hierarchical structure of KSF to improve operating performance of theme parks. The initial hierarchical structure serves as screening criteria of the fuzzy Delphi method in order to facilitate subsequent empirical research. The ultimate goal of this structure is to identify KSF to improve the operating performance of theme parks. Two more layers in sub-targets and evaluation items are further structured (Figure 1). In addition, Satty (1980) recommended that each dimension should not exceed seven factors. Therefore, we invite experts, such as government officials, academics and industry managers to select the seven key assessment criteria in four dimensions, including financial, customer, internal business processes and learning/growth dimensions (Table 1).

Questionnaire design and survey targets

First stage questionnaire design

This stage refers to the foundation of the initial hierarchical structure previously established in the design of expert questionnaires under the fuzzy Delphi method in order to evaluate the appropriateness and importance

Table 1. Summary of evaluation factors for the dimensions of the BSC

	Evaluation Standard	Scholar
Financial dimensions	1. Operating income 2. Operating growth 3. Low unit cost 4. Improved product channel 5. Return on investment 6. Improved return on assets 7. Cost control 8. Capital turnover 9. Annual budget 10. Environmental enhancement cost 11. Ratio of personnel affair expenditure to total expenditure 12. Contribution of new price strategy to profits	Kaplan and Norton (1992) Denton and White (2000) Olson and Slater (2002) Papalexandris, et al. (2004) Davis and Albright (2004) Lee et al. (2006) Getz and Brown (2006) Lee and Hsu (2008)
Customer dimensions	1. Market share 2. Customer satisfaction 3. Customer loyalty 4. Customers' benefits 5. Number of customers' complaints 6. Service and product quality 7. Customer waiting time 8. Market segmentation and share 9. Market competitive advantage 10. New customer acquisition 11.Business image and reputation 12. Advertisements satisfying customer needs 13. Customer relation and value 14. Service immediateness	Kaplan and Norton (1992) Denton and White (2000) Olson and Slater (2002) Papalexandris et al. (2004) Davis and Albright (2004) Lee et al. (2006) Getz and Brown (2006) Lee and Hsu (2008) Lee and Lin (2010)
Internal business processes dimensions	1. Brand management 2. External coordination of the firms 3. After sales service 4. Remarkable manufacturing and design 5. Environmental innovation and design 6. Product delivery speed and tracking ability 7. Convenience of information checking and business procedure 8.Performance upgrading operation and standard operating procedure 9. Assessment and examination of special projects 10. Time requirements of key process and mission	Kaplan and Norton (1992) Denton and White (2000) Olson and Slater (2002) Papalexandris et al. (2004) Davis and Albright (2004) Lee et al. (2006) Getz and Brown (2006) Lee and Hsu (2008)
Learning/ growth dimensions	1. Employees' service attitude 2. Number of employees' suggestions and proposals 3. Employee satisfaction 4. Employee educational training 5. Employees' productivity 6. Employees' continuity 7. Application ability of information system 8. Understanding of knowledge and technology 9. Measurement of group performance 10. Employee management system	Kaplan and Norton (1992) Denton and White (2000) Olson and Slater (2002) Papalexandris et al. (2004) Davis and Albright (2004) Lee et al. (2006) Getz and Brown (2006) Lee and Hsu (2008) Lee and Lin (2010)

of each dimension measurement and evaluation indicator. The questionnaire consists of three parts: explanations for answering, questionnaire contents, and data basis of the respondents. The scores range from 0 to 10; thus, the higher the score, the higher the importance attributed to the item. In addition to filling in the level of acceptance and the single-value measurements in terms of importance, each evaluation item in the questionnaire has a space for experts to provide their valuable inputs based on their individual perceptions by giving an integer value to indicate the importance of each strategic factor and indicator.

Second stage questionnaire design

This stage applies the fuzzy Delphi method to analyze the results of the questionnaire survey and screen out the

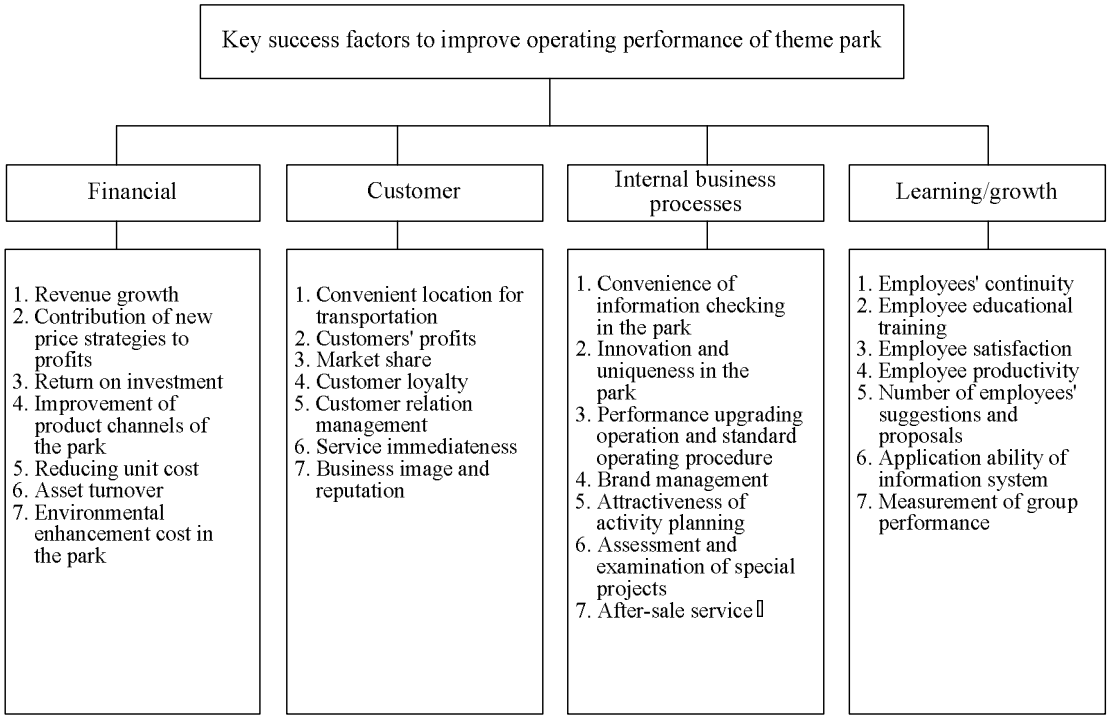

Figure 1. Hierarchical structure.

success factor according to the consensus of experts. A complete hierarchical structure is established for the questionnaire design under the FAHP. The questionnaire consists of the following two parts: (1) evaluation criteria to rank each individual criterion in terms of relative importance and (2) evaluation methods to measure the results on a 1 to 9 scale and compare pairs according to the answers provided in the expert questionnaires.

Survey target

Two expert questionnaire surveys are conducted as research bases, selecting tourism professionals, government officers familiar with the industry, and scholars in this field as respondents. Priority is given to those who are able to fill in the questionnaires. Robbins (1994) has indicated that the number of experts should be ideally between five and seven for the issues that require collective decisions. In order to make the dimensions more objective, this paper adopts judgment sampling during the first stage by releasing 20 expert questionnaires under the fuzzy Delphi method. From these, 18 effective questionnaires were retrieved. Respondents are government officers, industry players, and university professors in relevant fields. This paper uses judgmental sampling in the second stage. A total of 20 expert questionnaires under the FAHP were released; among which 16 effective questionnaires were retrieved. The respondents were also government officers, industry players, and university professors in relevant fields.

FUZZY DELPHI METHOD

This paper introduces the fuzzy theory into the Delphi method by integrating it with the points of view of many scholars, including Hwang and Lin (1987), Hsu (1998), Chen (2001), and so on. In order to improve the problems faced by the traditional Delphi method, this study used the bi-triangular fuzzy arithmetic to integrate the advice of experts, testing the convergent effect recognized by experts through the “gray zone test method.” The fuzzy Delphi method is established by the following steps:

Step 1: Each expert offers a possible interval value to each assessed item. The minimum value of this interval number represents the most conservative perceived value given by the expert to the quantitative score of the assessed item, while the maximum value represents the most optimistic perceived value given to the quantitative score of the assessed item.

Step 2: An analysis is made of the “most conservative perceived values” and “the most optimistic perceived values” are given to each assessed item *i* by all the experts. After the extreme value fell outside the variable “twice of standard deviation”, it was eliminated, then the minimum value C_L^i, the geometric mean C_M^i, and the maximum value C_U^i of “the most conservative perceived value” that have not been eliminated, and the minimum

value O_L^i, the geometric mean O_M^i and the maximum value O_U^i of "the most optimistic perceived value" were determined.

Step 3: Through the steps in the foregoing, the triangular fuzzy number $C^i = (C_L^i, C_M^i, C_U^i)$ of "the most conservative perceived value" and the triangular fuzzy number $O^i = (O_L^i, O_M^i, O_U^i)$ of "the most optimistic perceived value" of each assessed item *i* were established.

Step 4: Finally, the following methods could be applied to verify the degree of consensus by experts.

1. Gray zone does not exist: if $C_U^i \leqq O_L^i$, the bi-triangular fuzzy numbers do not overlap. This means that the interval values given by experts share a common section. In other words, the most conservative perceived value given by each expert to the assessed item *i* leans toward the section scope of triangular fuzzy number of the most conservative perceived value. Meanwhile, the most optimistic perceived value given by each expert to the assessed item *i* leans toward the section scope of triangular fuzzy number of the most optimistic perceived value. This means that the most conservative perceived values and the most optimistic values given by all the experts reached consensus as far as the assessed item *i* is concerned. Therefore, the value G^i of the importance degree of consensus of the assessed item *i* shall equal the mean value of C_M^i and O_M^i, and its operational formula is seen as follows:

$$G^i = (C_M^i + O_M^i)/2$$

2. Gray zone exists, and a small difference exists among the experts' advice: If $C_U^i > O_L^i$, the bi-triangular fuzzy numbers overlap. When the gray zone of the fuzzy relation $Z^i = C_U^i - O_L^i$ is smaller than the interval value $M^i = O_M^i - C_M^i$ between the geometric mean of the optimistic perceived value and the geometric mean of the conservative perceived value given by the experts to the assessed item, the interval value given by each expert produces a fuzzy section. The extreme values given by some experts do not greatly differ from the ones given by other experts; hence, no differences and divergences on the value happen. Therefore, the value G^i of the importance degree of consensus of the assessed item *i* equal the fuzzy set $F^i(\chi_j)$, resulting from the intersection (min) operation for the gray zone of the fuzzy relation of bi-triangular fuzzy numbers, and the quantitative score $\mu_{F^i}(\chi_j)$ of the maximum value of membership grade owned by the fuzzy set is determined. Its operational formulas are seen as follows:

$$F^i(x_j) = \left\{ \int_x \{\min[C^i(x_j), O^i(x_j)]\} dx \right\}$$

$$G^i = \left\{ \chi_j \middle| \max \mu_{F^i}(\chi_j) \right\}$$

3. Gray zone exists and a big difference exists among the experts' advice: If $C_U^i > O_L^i$, the bi-triangular fuzzy numbers overlap. When the gray zone of the fuzzy relation $Z^i = C_U^i - O_L^i$ is bigger than the interval value $M^i = O_M^i - C_M^i$ between the geometric mean of the optimistic perceived value and the geometric mean of the conservative perceived value given by the expert to the assessed item, the interval value given by each expert produces a fuzzy section. The extreme values given by some experts greatly differ from the ones given by other experts; hence, differences and divergences on the values happen. Therefore, "the geometric mean of the optimistic perceived value" and the "geometric mean of the conservative perceived value" of the assessed items that have not reached convergence must be provided to the experts as references. Then, Steps 1 to 4 shall not be repeated to conduct the next questionnaire survey until all the assessed items reach convergence, and "the value of importance degree of consensus" G^i is determined.

Fundamentally, the higher the value of the importance degree of each item determined in the foregoing, the higher the degree of consensus it represents among the experts. The arithmetic mean can then be determined by using the geometric mean of the maximum possible single value of each item, which can be taken as the threshold value for the research to select a suitable number of assessment criteria featuring the consensus of the experts.

Fuzzy analytic hierarchy process (FAHP)

This study adopts FAHP as the method for obtaining the weight relationship and degree of importance of different assessment criteria. It introduces the fuzzy theory into the AHP developed by Saaty (1980) to assess the weight of various assessment criteria and sort the importance, by which more objective and reasonable KSFs could be induced (Lee, 2008; Lee and Hsu, 2008). This analytical process combines the concepts of several scholars, including Buckley (1985), Robbins (1994), Hsu (1998) and Chen (2002). The steps used are as follows:

Step 1: Establish the hierarchy structure: Based on the assessment criteria screened out by the fuzzy Delphi method and the sequence of terminal target, secondary target and the assessed items, hierarchal structure is established, and each level has seven elements at most.

Step 2: Establish the pairwise comparison matrix: The opinion of Expert K in Level L on the relative importance of any two assessed items in Level L+1 could be obtained through the questionnaire survey, by which pairwise comparison Matrix A, $A = [a_{ij}]$ could be

established.

Step 3: Establish the triangular fuzzy number: This study adopts the geometric average to represent the consensus of most experts as the model of triangular fuzzy number. Afterwards, triangular fuzzy numbers are established based on the fuzzy Delphi method to integrate experts' fuzzy opinions on the relative importance of paired elements. The expression is as follows:

$$\tilde{a}_{ij} = (\alpha_{ij}, \delta_{ij}, \gamma_{ij})_{L-R}, \quad \alpha_{ij} \le \delta_{ij} \le \gamma_{ij}, \quad i, j = 1,2,....., n$$

$$\alpha_{ij} = Min(B_{ijk}), \quad k = 1,2\cdots, n$$

$$\delta_{ij} = \left(\prod_{k=1}^{n} B_{ijk}\right)^{1/n}$$

$$\gamma_{ij} = Max(B_{ijk}) \quad k = 1,2\cdots, n$$

where $\tilde{a}_{ij}$ is the triangular fuzzy number; α_{ij} is the minimum no. j secondary criterion under no. i criterion; δ_{ij} is the geometric average of no. j secondary criterion under no. i criterion; γ_{ij} is the maximum no. j secondary criterion under no. i criterion and B_{ijk} is the Expert K's subjective opinion on relative importance of attributes i and j, which are definite values.

$L-R$: fuzzy interval of triangular fuzzy numbers.

Step 4: Establish fuzzy positive reciprocal matrix: Triangular fuzzy numbers are established to express the phenomenon of assessing experts' fuzzy opinions; hence, a fuzzy positive reciprocal matrix $\tilde{A}$ could be established.

$$\tilde{A} = \left[\tilde{a}_{ij}\right] = \begin{bmatrix} \tilde{a}_{11} & \tilde{a}_{12} & \cdots & \tilde{a}_{1n} \\ \tilde{a}_{21} & \tilde{a}_{22} & \cdots & \tilde{a}_{2n} \\ \vdots & \vdots & \vdots & \vdots \\ \tilde{a}_{n1} & \tilde{a}_{n2} & \cdots & \tilde{a}_{nn} \end{bmatrix}, \quad i, j = 1,2\cdots, n$$

$$\tilde{a}_{ij} = [\alpha_{ij}, \delta_{ij}, \gamma_{ij}], \quad \tilde{a}_{ij} \times \tilde{a}_{ji} \approx 1, \quad \forall_{ij} = 1,2,\cdots, n$$

Step 5: Fuzzy matrix: $\tilde{A}$ consistency verification: This paper assumes that $A = \left[a_{ij}\right]$ is a positive reciprocal matrix and $\tilde{A} = \left[\tilde{a}_{ij}\right]$ is a fuzzy positive reciprocal matrix. Hence, $A = \left[a_{ij}\right]$ is consistent, as well as $\tilde{A} = \left[\tilde{a}_{ij}\right]$, by which to judge the validity of questionnaires. If experts think criterion C_i is more important than C_j, then the fuzzy paired comparisons are as follows:

$$\tilde{a}_{ij} = (\alpha_{ij}, \delta_{ij}, \gamma_{ij}), \quad \alpha_{ij}, \delta_{ij}, \gamma_{ij} \in \{1, 2, \cdots, 9\}$$

While

$$\tilde{a}_{ji} = \left(\tilde{a}_{ij}\right)^{-1} = \left(\gamma_{ij}^{-1}, \delta_{ij}^{-1}, \alpha_{ij}^{-1}\right)$$

If experts think criterion C_i and C_j are equally important, the fuzzy pairwise comparisons are $\tilde{a}_{ij} = (1,1,1)$.

Step 6. Calculate the fuzzy weight of fuzzy positive reciprocal matrix:

$$\tilde{Z}_i = \left[\tilde{a}_{ij} \otimes \ldots \otimes \tilde{a}_{in}\right]^{\frac{1}{n}}, \quad \forall i \quad , i, j = 1,2\cdots, n$$

$$\tilde{W}_i = \tilde{Z}_i \otimes \left(\tilde{Z}_i \oplus \ldots \oplus \tilde{Z}_n\right)^{-1}$$

$\tilde{Z}_i$: geometric average of triangle fuzzy numbers and $\tilde{W}_i$: the fuzzy weight of the triangular fuzzy numbers

$$\tilde{a}_1 \otimes \tilde{a}_2 \cong (\alpha_1 \times \alpha_2, \delta_1 \times \delta_2, \gamma_1 \times \gamma_2)$$

$$\tilde{a}_1 \oplus \tilde{a}_2 \cong (\alpha_1 + \alpha_2, \delta_1 + \delta_2, \gamma_1 + \gamma_2)$$

$$Z_1^{-1} = \left(\gamma_1^{-1}, \delta_1^{-1}, \alpha_1^{-1}\right)_{L-R}$$

$$\tilde{a}_1^{\frac{1}{n}} = \left[\alpha_1^{\frac{1}{n}}, \delta_1^{\frac{1}{n}}, \gamma_1^{\frac{1}{n}}\right]$$

Step 7: Defuzzication: Since the weight of every element and assessed item is a fuzzy value, the single fuzzy weight must be obtained by the defuzzication process. This study adopts the gravity method for defuzzication, and its expression is as follows:

$$W_i = \frac{W_{\alpha i} + W_{\delta i} + W_{\gamma i}}{3}$$

where $W_{\alpha i}$ is the left end fuzzy weight value of the triangular fuzzy numbers, namely the minimum; $W_{\delta i}$ is the value which shows that the grade of membership of the triangular fuzzy number's weight is 1; $W_{\gamma i}$ is the right end fuzzy weight value of the triangular fuzzy members, namely the maximum; and W_i converts the fuzzy weight of the triangular fuzzy numbers into a single value.

Step 8: Normality: Weight values obtained are normalized to compare the importance of various major structural dimension criteria and secondary assessment criteria so that their sum is 1. The formula for weight normalization is as follows:

$$NW_i = \frac{W_i}{\sum_{i=1}^{n} W_i}$$

Where:

NW_i = normalized weight and W_i = single fuzzy weight

KSFs of the operational performance of theme park

Analysis of fuzzy Delphi method questionnaire survey in the first stage (Establish the hierarchy structure of expert consensus)

This paper utilizes the fuzzy Delphi method and excels to derive the threshold value (7.4) of the screening criteria. Therefore, 12 criteria were eliminated and only 16 were retained as candidates for KSFs, accounting for 57.14% of the total evaluation criteria (Table 2). According to the screening results, this paper constructs the strategic hierarchical structure of KSFs to improve the operating performance of theme parks (Figure 2). Afterwards, it designs the expert questionnaire under the FAHP for the second stage.

The second stage of FAHP questionnaire survey analysis (Screen out the KSFs that enhance competitive advantages)

This paper adopts the calculation method of the aforesaid FAHP, processing the expert questions with excel during the second stage. First, the triangular fuzzy numbers were utilized to establish a fuzzy positive reciprocal matrix as the basis to compute the fuzzy weightings, after which consistency tests on the matrix were conducted with the definite values assigned by experts. The result showed that the CI and CR values of KSFs in improving the operating performance of theme parks were both ≦0.1. This result is in agreement with the acceptable error range suggested by Saaty (1980). This indicates that the prior and subsequent judgments from experts among all the hierarchies are consistent. In addition, the overall evaluation analysis of the CRH of KSFs used to improve the operating performance of theme parks is 0.06, and is in compliance to the criterion of CRH<0.1, which indicated that the hierarchical structure established by this paper has appropriate allocations in terms of hierarchical relationships. Therefore, the overall consistency of the hierarchies is acceptable. Evaluating the relative weighting of each evaluation factor in their respective hierarchies, such as local advantages, is then possible. Further calculations of the overall weightings are made in order to understand the percentage of weightings in absolute numbers of different factors in the overall structure. Finally, a priority ranking is made based on the computed weightings of absolute values. The result shows the evaluation factors that experts emphasize for the KSFs to improve the operating performance of theme parks (Table 3).

According to Table 3, among the 16 evaluation items of the second level, experts regard "employee educational training" to be the most important, with a weighting of 0.131, followed by "employee satisfaction," with a weighting of 0.105. The third to the tenth items of importance are "business image and reputation" (0.081); "service immediateness" (0.080); "attractiveness of activity planning" (0.071); "convenient location for transportation" (0.070); "performance upgrading operation and standard operating procedure" (0.067); "innovation and uniqueness in the park" (0.062); "customer loyalty" (0.061) and "revenue growth" (0.047). Among the top ten evaluation items, four are under the customer dimension, three are under the internal business processes dimension, two are under the learning/growth dimension, and one is under the financial dimension.

As to the number of KSFs chosen, this study has made a reference to the concept of KSFs in Daniel's (1961) thesis "management information crisis," in which he points out that most industries have three to six KSFs. Most scholars who have studied key success factors in recent years have defined four to six key success factors. Hence, this study has decided to select the top six factors in the column "importance sequence" (Table 3) as the KSFs to improve the operating performance of theme parks. These factors are "employee educational training," "employee satisfaction," "business image and reputation," "service immediateness," "attractiveness of activity planning," and "convenient location for transportation."

Management implications of KSFs

To enhance the theme park's operating performance, this paper proposes the following suggestions with management implications of KSFs:

1. In terms of employee educational training, parks may

Table 2. Fuzzy Delphi method questionnaire analysis and survey.

Dimension	Assessment criteria	Most optimistic cognition triangular fuzzy number (O_L^i, O_M^i, O_U^i)			Most conservative triangular fuzzy number (C_L^i, C_M^i, C_U^i)			Single-value geometric average	M^i	Z^i	Expert opinion interval	G^i
Finance	Revenue growth	10	9.4	8	8	5.9	4	8.1	3.5	0	O	7.7
	Contribution of new price strategies to profits	10	8.6	6	6	5.4	4	6.7	3.2	0	O	7.0
	Return on investment	10	9.1	8	8	6.2	4	7.1	2.9	0	O	7.7
	Improvement of product channels of the park	10	8.8	7	8	6.3	5	7.5	2.5	1	X	7.5
	Reducing unit cost	10	9.8	9	8	6.3	5	7.9	3.5	-1	O	8.1
	Asset turnover	10	8.8	8	7	5.2	3	7.0	3.6	-1	O	7.0
	Environmental enhancement cost in the park	10	8.2	6	6	5.0	3	6.8	3.2	0	O	6.6
Customer	Convenient location for transportation	10	9.6	9	7	6.1	5	8.2	3.5	-2	O	7.9
	Customers' profits	10	8.7	6	8	5.7	3	7.4	3.0	2	X	7.1
	Market share	10	9.1	8	7	5.1	3	7.5	4.0	-1	O	7.1
	Customer loyalty	10	9.4	8	7	6.2	5	7.9	3.2	-1	O	7.8
	Customer relation management	10	8.8	7	8	5.5	4	7.5	3.3	1	X	7.4
	Service immediateness	10	9.4	7	7	6.2	5	8.1	3.2	0	O	7.8
	Business image and reputation	10	9.4	7	8	6.7	5	8.7	2.7	1	X	7.6
Internal business processes	Convenience of information checking in the park	10	8.8	7	7	5.0	3	6.9	3.8	0	O	6.9
	Innovation and uniqueness in the park	10	9.2	8	8	5.8	3	8.1	3.4	0	O	7. 5
	Performance upgrading operation and standard operating procedure	10	9.2	8	8	6.2	5	7.8	3.0	0	O	7.7
	Brand management	10	8.4	7	8	5.5	3	7.0	2.9	1	X	7.4
	Attractiveness of activity planning	10	9.5	8	7	6.0	5	8.2	3.5	-1	O	7.8
	Assessment and examination of special projects	10	9.3	8	7	5.7	5	7.8	3.6	-1	O	7.5
	After sales service	10	9.0	8	7	5.1	3	7.3	3.9	-1	O	7.1

adopt long-term investment to cultivate certain capabilities of the employees and allow them to contribute on a wider scale, as well as short-term investment to improve their current performance.

2. In terms of employee satisfaction, Price (1997) has stated that satisfied employees hold positive emotion and reflection toward the organization, and conversely, dissatisfied employees hold the opposite. Moreover, environmental factors influence employees' mental and physical satisfaction. Therefore, park management could improve employee satisfaction by empathizing with the challenges of their jobs, improving their compensation, establishing interpersonal relationships with them, creating open communications,

Table 2. cont.

Learning/ growth	Employees' continuity	10	8.8	8	7	5.3	3	7.2	3.5	-1	O	7.1
	Employee educational training	10	9.1	8	7	5.9	4	7.4	3.2	-1	O	7.5
	Employee satisfaction	10	9.1	8	7	5.8	5	7.3	3.3	-1	O	7.5
	Employee productivity	10	8.8	7	7	5.1	3	7.2	3.7	0	O	7.0
	Number of employees' suggestions and proposals	10	8.3	7	7	3.6	1	5.9	4.7	0	O	6.0
	Application ability of information system	10	8.6	6	8	5.4	4	5.9	3.2	2	X	7.0
	Measurement of group performance	10	8.9	6	8	5.2	3	7.4	3.7	2	X	7.0
	Threshold value	7.4										

1: In the range value of experts' opinions, "O" indicates $C_U^i \le O_L^i$, with consensus among experts. The formula $G^i = (C_M^i + O_M^i)/2$ is used to calculate the consensus value. "X" indicates $C_U^i > O_L^i$, $Z^i = C_U^i - O_L^i < M^i = O_M^i - C_M^i$, showing that there is very little difference among experts in their opinions. The intersection (min) derives a fuzzy set. The maximum membership value of this fuzzy set is then derived to compute the consensus value of experts' opinions.
2: The gray areas indicate the evaluation criteria eliminated.

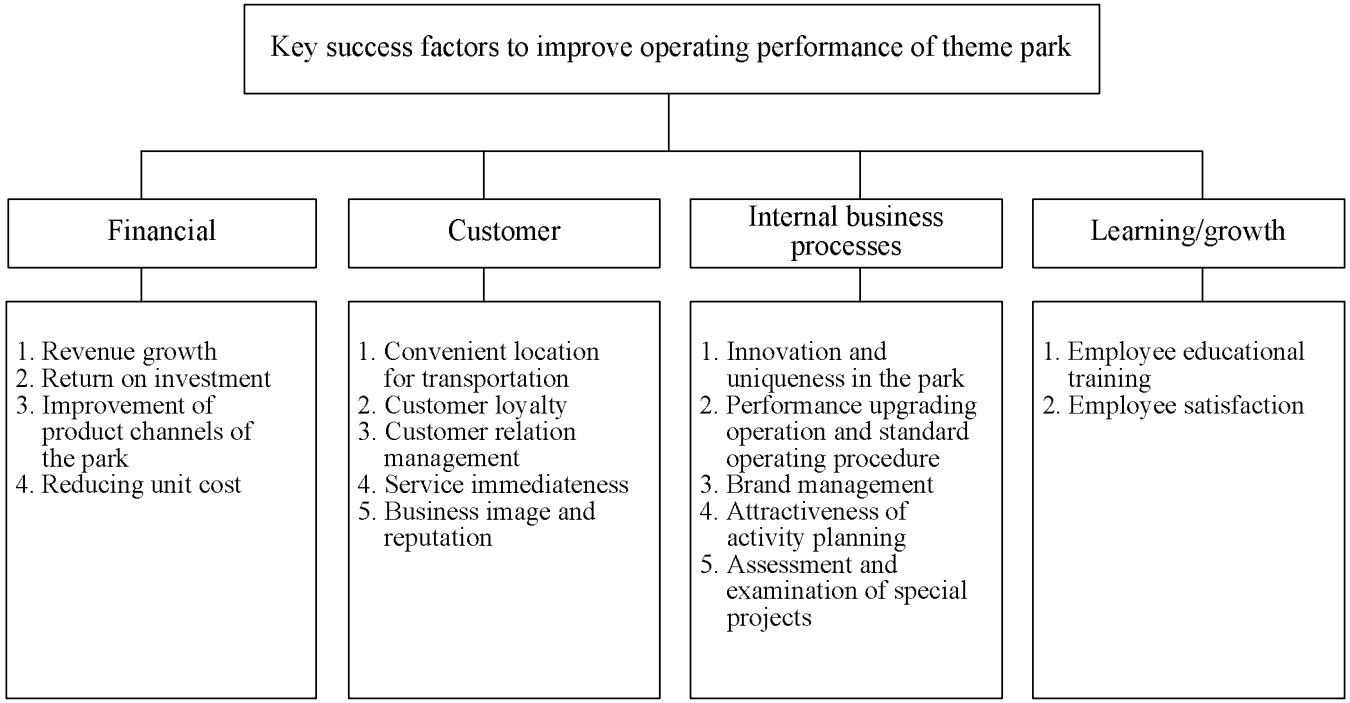

Figure 2. Hierarchical structure of potential KSFs used to improve the operating performance of theme parks.

Table 3. Analysis of the overall evaluations of theme parks.

First hierarchy	Weighting	Second hierarchy	Relative weighting	Absolute weighting	Importance sequence
Financial	0.175	Revenue growth	0.268	0.047	10
		Return on investment	0.252	0.044	11
		Improvement of product channels of the park	0.230	0.040	13
		Reducing unit cost	0.250	0.044	12
Customer	0.329	Convenient location for transportation	0.211	0.070	6
		Customer loyalty	0.184	0.061	9
		Customer relation management	0.115	0.038	15
		Service immediateness	0.244	0.080	4
		Business image and reputation	0.246	0.081	3
Internal business processes	0.260	Innovation and uniqueness in the park	0.240	0.062	8
		Performance upgrading operation and standard operating procedure	0.260	0.067	7
		Brand management	0.070	0.018	16
		Attractiveness of activity planning	0.271	0.071	5
		Assessment and examination of special projects	0.150	0.039	14
Learning/ growth	0.236	Employee educational training	0.556	0.131	1
		Employee satisfaction	0.444	0.105	2

C.R.H=0.06.

allowing room for promotion, and providing room for their development.

3. In terms of image and goodwill, the park could enhance its image through proper choice of words, concepts, information, and provision of high-quality products and services. For example, parks can endow its customers with a sense of adventure or magical dreams-come-true, or the parks can be designed as resorts for leisure and the likes of others. The parks can also evoke the trust of its customers and enable them to fully relax themselves and thus spend more time in these parks.

4. In terms of timely service, keeping customers by responding quickly and appropriately to their demands is necessary in an environment with such fierce competition. Therefore, it is suggested for the park to provide customers with required services as quickly as possible, actively assist customers with their concerns and make them feel at home, thereby increasing the rate of their revisiting.

5. In terms of attractive activity planning, original and interesting activity plans could draw more tourists to the park. Therefore, the management could invite popular stars for theme-oriented activities and make the park a location for shooting films. They could also establish different thematic atmospheres for different holidays to attract more tourists.

6. In terms of convenient transportation, the tourism bureau has pointed out that most native Chinese only travel short distances. Therefore, the park could actively plan convenient transportation system for tourists or ensure that the park is located in a place with convenient transportation, thereby shortening time spent on transportation and enabling tourists to spend more time experiencing the facilities in the park.

Strategic blueprint to improve the operating performance of theme parks

Here, an elaboration is done on KSFs to improve the operating performance of theme parks by designing a strategic blueprint, which is further divided into three parts: (1) the missions and visions of theme park; (2) the relationship among KSFs; and (3) the strategic goals under KSFs. The integration of these is the strategic blueprint for theme parks to improve their operating performance.

Determination of missions and visions of theme park

Missions are the reasons for an organization's existence, while visions are the directions toward which an organization strives. The integration of missions and visions leads both employees and managers toward the same direction, creating sustainability of the company. Figure 3

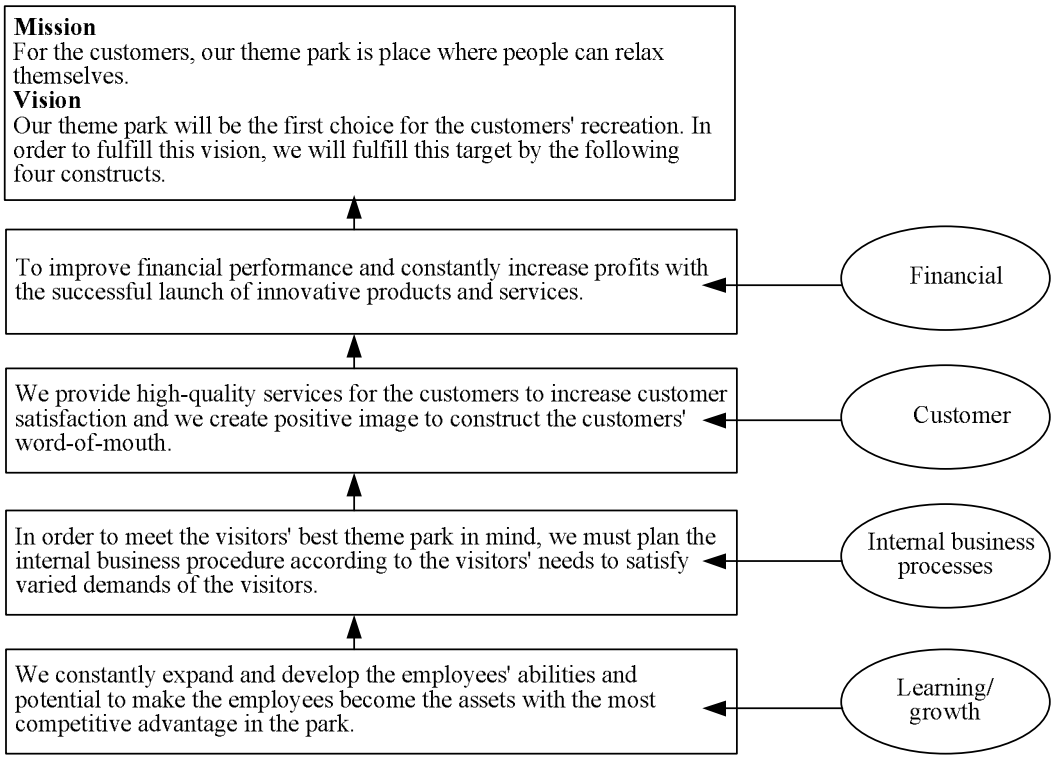

Figure 3. Mission and vision to improve the operating performance of theme parks.

refers to the concept of KSFs mentioned in this paper to define the mission and vision of a theme park. The industry may modify this list according to each player's particularities, serving as reference in the introduction of the BSC.

Relationship of KSFs

KSFs refer to the areas where an organization must excel in order to survive, or the key issues that determine the success of an organization. Theme parks may use KSFs to develop their organizational strategies and create competitive advantages in the market. Figure 4 summarizes the KSFs selected by this paper and illustrates the relationship among these KSFs. All the factors aim to create a shared goal for the organization and interlock this goal to the organization. The KSFs mentioned in this paper do not incorporate financial dimension factors, as their ultimate goal is to increase earnings and improve financial performance. Therefore, the item "outstanding financial performance" is used to substitute the financial dimension in this flowchart.

The figure shows that "employee educational training" and "employee satisfaction" under the learning/growth dimension affect the "attractiveness of activity planning" under the internal business processes dimension. As a result, "business image and reputation," "service immediateness," and "convenient locations for transportation" under the customer dimension, are affected, and eventually "outstanding financial performance" is impacted.

Determination of strategic goals

Strategic goals are measurable results derived from KSFs. The purpose of strategic goals is to fulfill visions with crisp and effective goals for both managers and employees. The KSFs selected by this paper and the corresponding strategic goals under the four dimensions of the BSC are as follows:

1. Customer dimension: Strategic goals of the customer dimension are to seek targeted customers, enhance the perception of customers regarding the product, and eventually create market leadership for the theme park. This paper refers to "business image and reputation," "service immediateness," and "convenient locations for transportation" as the three success factors under the customer dimension, with corresponding strategic goals shown in Table 4.
2. Internal business processes dimension: Strategic goals of the internal business processes dimension are to constantly improve the key workflows that enhance value to customers and shareholders. In order to meet the expectations from customers and shareholders, the improvement of internal business processes is essential. This paper extends the KSF "attractiveness of activity

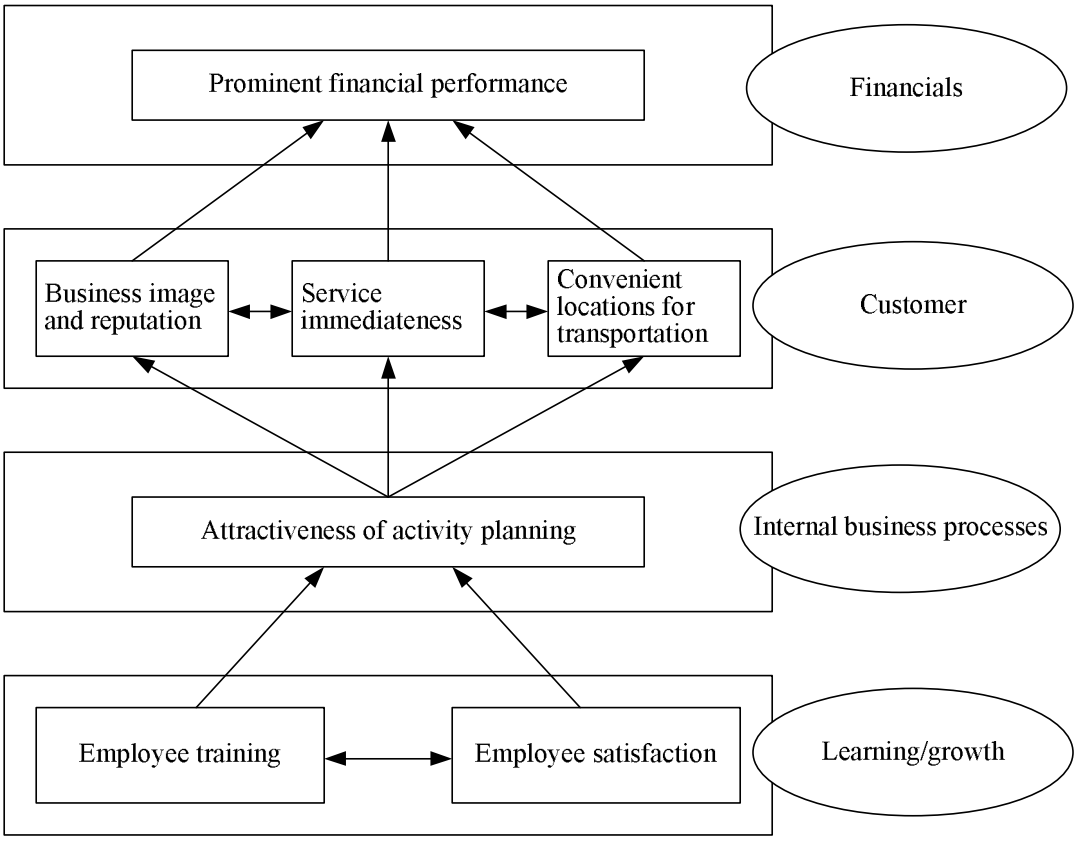

Figure 4. Relationship of KSFs.

planning," with the corresponding strategic goals shown in Table 4.

3. Learning/growth dimension: The learning/growth dimension of the BSC is the driving force for the other three dimensions. If a company wishes to achieve better results in internal business processes, customers and financiers, it has to regard learning/growth as the foundation of the other dimensions. This paper refers to the "employee educational training" and "employee satisfaction" of the KSFs with the strategic goals shown in Table 4.

4. Financial dimension: The strategic goals of the financial dimension are to understand whether or not the strategic goals developed under the customer, internal business processes, and learning/growth dimensions are accurately implemented, and whether such executions are ultimately reflected in the maximization of the value of shareholders. Therefore, theme parks may refer to the strategic goals under the customer, internal business processes, and learning/growth dimensions as measurements reflecting financial performance.

Strategic goals are interlocked and interrelated; though one goal serves as a stepping-stone to another, and they are all geared to achieve the ultimate goals of the organization. Theme parks may refer to the strategic goals proposed in this paper, in that these goals may be combined with the company's own specific goals in order to develop the causal-relationship chain of strategic goals as steps to introduce the BSC and subsequent measurements.

Strategic blueprint to improve operating performance of theme parks

Kaplan and Norton (1993) have indicated in their strategic flowchart of visions and measurement indicators that the construction of the BSC should start with the vision, followed by the perspectives of the four dimensions and the establishment of KSFs accordingly. Strategic goals should be defined based on these KSFs. The clarification of visions helps the company to understand its future visions and how to get there. KSFs include the key elements of the present operational activities and the future of the organization; however, they are the required competitive advantages in the midst of the competition.

To sum up, this paper has applied the strategic flowchart proposed by Kaplan and Norton (1993) by combining the visions and missions of theme parks, as well as their KSFs and strategic goals to create a strategic blueprint to improve operating performance.

Table 4. Establishment of strategic objectives

Dimension	Key success factors	Strategic objectives
Customer	Business image and reputation	1. Creating the image of the park 2. Developing feature marketing of theme park
	Service immediateness	1. Establishing high-quality service 2. Responding to the customers' demands in the shortest time 3. Reducing the number of customers' complaints
	Convenient location for transportation	1. Planning complete transportation routes 2. Providing complete mass transportation system
Internal business processes	Attractiveness of activity planning	1. Strategic alliance with related industries 2. Developing traveling itineraries and special trips with features
Learning/growth	Employee educational training	1. Increasing the employees' professional knowledge 2. Cultivating the employees' specific work abilities 3. Improving the employees' present work performance
	Employee satisfaction	1. Fulfilling pleasant work atmosphere 2. Employees' knowledge share 3. Increasing employees' work efficiency

This paper begins with the vision "a theme park is synonymous to recreation in the hearts of customers, making us their first choice for leisure and traveling." The KSFs are screened out along the four dimensions of the BSC, and defined into strategic goals in accordance with industry characteristics. Finally, theme parks may work gradually on each strategic goal in order to enhance their operating performance and eventually achieve their missions and visions (Figure 5).

CONCLUSIONS

Private theme parks have gradually become the main-stream of the tourism industry in Taiwan. With many firms involved in this industry, strong competition has thus become inevitable. By helping parks identify their KSFs, upgrade the operational performance of theme parks, develop the related strategic blueprint, and maximize the limited resources of firms in the key fields, this study can play an important role in the industry of theme park. Thus, the factors influencing the operational performance of theme parks vary. By generalizing and clarifying various factors according to different constructs in a hierarchical framework, such elements can then be simplified and converted as the criteria for decision making.

This paper has conducted the first-stage questionnaire survey under the fuzzy Delphi method by inviting experts in tourism and related fields. The contents of the questionnaire are based on relevant literature from both domestic and foreign scholars. These are summarized into the evaluation factors in accordance with the KSFs to improve the operating performance of theme parks. The fuzzy Delphi method is used to analyze and screen out the 16 evaluation criteria agreed upon by experts as potential KSFs. Among these 16 criteria, 4 are under the financial dimension, 5 are under the customer dimension, 5 are under the internal business processes dimension, and 4 are under the learning/growth dimension.

In addition, this paper has conducted FAHP to compute the relative weightings of each dimension and evaluation item for the improvement of the operating performance of theme parks. These weightings are ranked based on their absolute values. In addition, this paper refers to Daniel (1961) and extracts six factors as the KSFs to improve the operating performance of theme parks. These factors are "employee educational training," "employee satisfaction," "business image and reputation," "service immediateness," "convenient location for transportation," and "attractiveness of activity planning." Improvement of the operating performance requires more than the financial indicators traditionally emphasized. Operating performance may be improved by exerting further efforts in the customer, internal business process, and learning/growth dimensions.

Finally, this paper followed the strategic flow chart proposed by Kaplan and Norton (1993), combining the missions, visions, KSFs, and strategic objectives of theme parks to propose a strategic blueprint in increasing the operational performance of theme parks (Figure 5). The research findings of this paper can function as the precise criteria with respect to the future development of

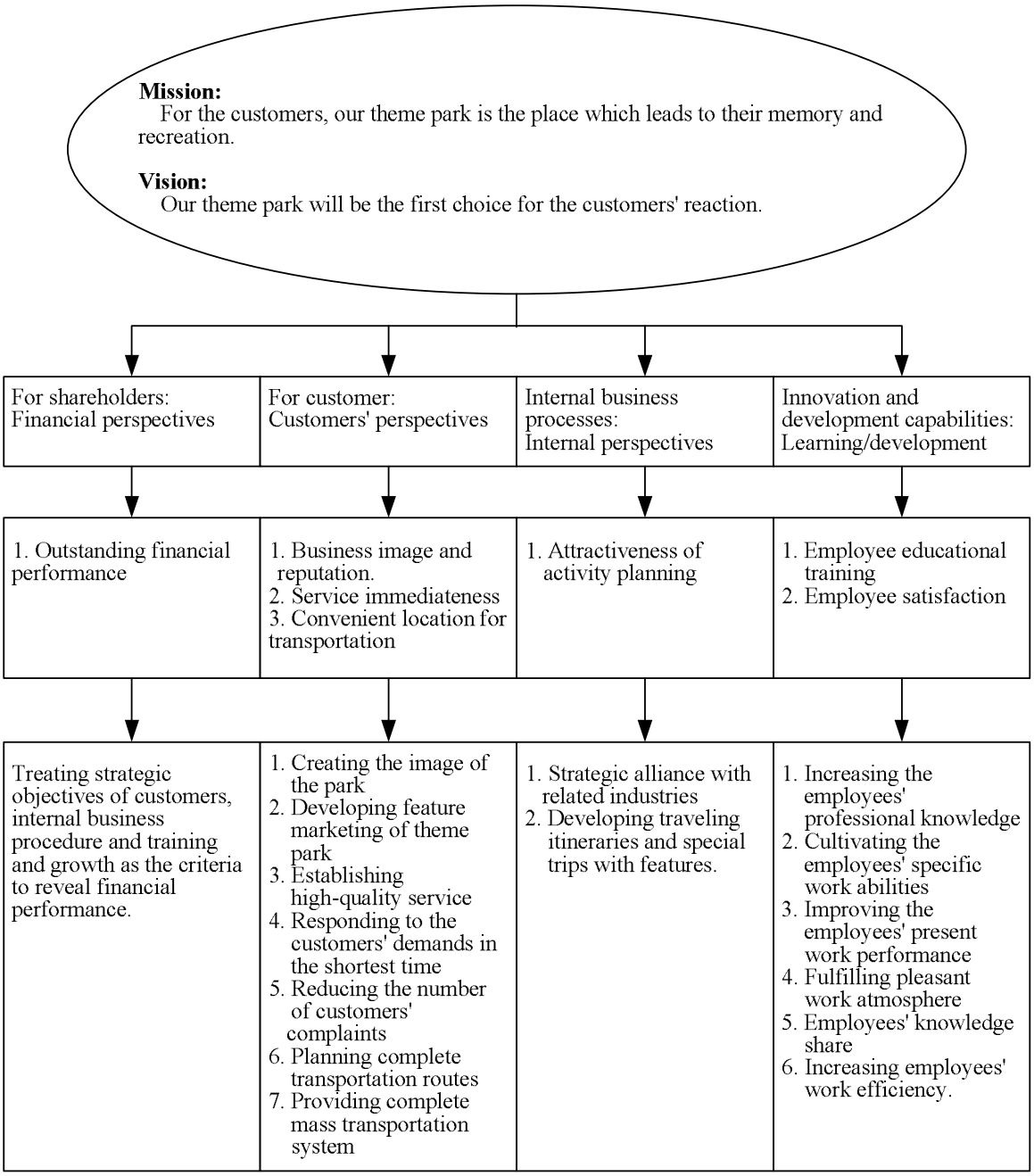

Figure 5. Blueprint for enhancing the operational performance of theme parks.

policies on theme parks in Taiwan and help theme park firms upgrade their operational performance and sustain their competitive advantages. Therefore, in order to increase operational performance, theme park firms must not simply focus on the financial aspect valued traditionally, but must also make efforts to satisfy the customers, carry out internal business procedures, and implement training and growth programs, which are the non-financial aspects of theme parks. Through these, they will be likely to effectively upgrade the operational performance of theme parks.

LIMITATIONS OF THE RESEARCH

Saaty (1980) has suggested that not more than seven essential factors should be included in each level. To conform to this principle, the initial structure established in this research contains only 28 evaluation principles of possibilities, excluding many excellent factors. In

addition, as this research primarily aims to compare, assess and arrange the level of importance of all the evaluation principles, the fundamental AHP hypothesis which states that factors of each level are independent (Saaty, 1980) still holds true for this research.

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