



## A balanced scorecard approach to establish a performance evaluation and relationship model for hot spring hotels based on a hybrid MCDM model combining DEMATEL and ANP

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### ABSTRACT

The balanced scorecard approach is an effective technique for performance evaluation. For more accurately reflecting the dependence and feedback problems of each factor in real world situations, here a new model is developed using a balanced scorecard approach for evaluating the performance of hot spring hotel. A DANP hybrid MCDM model is adopted to solve the dependence and feedback problems, while establishing a performance evaluation and relationship model. An empirical case study is presented to demonstrate the effectiveness of the proposed hybrid MCDM model. Based on this study, the perspective between 'learning and growth', 'enterprise's internal processes', and 'customer', all aim for solid financial performance as the ultimate goal, and report a positive influence. This effective performance evaluation model developed by applying the hybrid MCDM enables business managers to understand the appropriate actions and achieve a competitive advantage.

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### 1. Introduction

In general, natural hot springs are comprised of geothermal water, containing minerals, gases, and certain elements that rise from underground via a vent. Hot spring pools, used for bathing, contain a combination of cold and hot water, gases and geothermal elements, and are thought to benefit human health. Taiwan is located in the juncture of the Eurasian Plate and Philippine Plate. The area has abundant hot spring resources, with varying chemical characteristics, scattered across the island. Every hot spring site has unique local features arising from its relationship with the local geology. Hot spring hotels are those hotels located in hot spring resource areas, where visitors can enjoy the hot springs, while having access to lodging, food services and social contact. They differ from ordinary hotels and resorts primarily due to the services associated with the core product of hot spring bathing (Hsieh, 2007). Europe has a long tradition of visiting hotel spas to obtain medical benefits. In recent years, regular hoteliers have rec-

ognized the benefits and increased revenue that a spa facility can bring (Thorsteinsdottir, 2005).

In 2009, the annual number of inbound travellers to Taiwan was around 4.4 million. The major recreation activities of such visitors were shopping (86.81%), visiting night markets (72.75%) and historical sites (57.19%), ecological tourism (29.77%), attending exhibitions (26.33%), visiting lakes (25.74%), and hot spring tourism (24.22%) (Taiwan Tourism Bureau, 2010a). Furthermore, hot spring tourism comprises 4.4% of the leisure activity of domestic tourists (Taiwan Tourism Bureau, 2010b). However, hot spring tourism has recently become fastest growing sector for both domestic and overseas visitors in Taiwan. This has naturally attracted the interest of the hot springs hotel industry. Not only has there been heavy investment in the construction of spa hotels, but also a significant increase in the development of hotel facilities centred on allowing guest to enjoy the hot springs. Taiwan's hot spring hotels have entered a mature stage. However there is still much variety in the operating style and business strategy of hotels in different areas, with spa products mainly as a subsidiary. As a consequence, product homogeneity is too high and market competition intense, which often makes it difficult for management to distinguish themselves from the pack and gain market share.

In recent years, drastic fluctuations in the global economic and financial environment have resulted in changes in the marketplace. As for all companies in the hospitality industry, the sales of hot spring hotels are highly contingent upon market change.

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To grow and become profitable amidst global competition, they have to enhance their performance across the board, addressing key questions such as: What is the current health of the industry and the interrelation between key indicators of performance assessment? If they can identify the major factors that will enhance the performance of the hot spring hotel and develop strategies accordingly, it will be possible to excel in a highly competitive market.

Successful performance results from goal achievement and project implementation (Wu and Hung, 2008). Methods for assessing performance evolve along with advances in technology and growing market demands. The tools which companies use to evaluate their own performance should offer some predictive qualities concerning future performance. Such tools should lead them to the most likely future and help translate strategies into action. Among all the performance assessment indicators, the balanced scorecard approach, proposed by Kaplan and Norton (2004) as a performance management system for strategic mapping, can best translate strategies into tangible goals and measurements. In structure it consists of strategic management tools related to both financial and non-financial indicators. One part of the tool evaluates the results of past efforts; while the other aimed at future assessments. There are many factors that impact the performance of hot spring hotels. These factors can be summarized and classified into different constructs and then condensed into a smaller number. This new list of factors acts as an effective reference for decision-making. Therefore, in this study, the balanced scorecard approach, which has been widely adopted as a performance indicator, is applied to measure the performance of hot spring hotels.

In the management of hot spring hotels, one wants to not only know which factors affect performance, but also understand the degree of influence of each factor, and which sub-factors affect these factors. The purpose of this study is to create a better framework for decision-making for this type of management evaluation. The balanced scorecard approach, developed by Kaplan and Norton (2004), is adopted for this purpose with Multiple Criteria Decision Making (MCDM) employed for the performance evaluation. There is a causal relationship between the four perspectives involved in this approach (Sim and Koh, 2002; Banker et al., 2004; Davis and Albright, 2004; Wu and Hung, 2008). The aim is to determine which sub-factors influence the four perspectives and their corresponding sub-factors, with the goal of establishing a more comprehensive performance evaluation framework for hot spring hotels. The relationship between each factor and its sub-factors is considered. With this methodology we are able to consider multiple criteria at the same time. It also helps the decision maker to estimate the best choice, by sorting a limited number of cases according to their characteristics. The sub-factors for the four perspectives are found by collecting and analyzing data.

The Decision Making Trial and Evaluation Laboratory (DEMATEL) technique is then used to confirm the relationship between various perspectives, to enhance our understanding of the complex issues related to performance. A network-relationship map (NRM) of the performance of the hot spring hotel is prepared, which, combined with the DEMATEL-based Analytic Network Process (DANP) helps to measure the mutual importance of each factor. However, the ANP method deals with normalization in the supermatrix by assuming that each cluster has equal weight. Although this method for normalizing the supermatrix is easy, it seems irrational to assume equal weights, because of the different degrees of influence of the criteria (Ou Yang et al., 2008). Our strategy is to utilize a hybrid MCDM model that combines DEMATEL and ANP to solve the dependence and feedback problems, thus more accurately reflecting real world situations.

With this in mind, we develop a framework to consider these factors by combining the graph-theory based DEMATEL method with an ANP approach (hereafter DANP). An empirical case based on real hot spring hotels is also presented to demonstrate the effectiveness of the hybrid DANP MCDM model. This method offers a more complete decision-making model especially designed to solve performance evaluation problems for hot spring hotels.

## 2. Literature review

This section discusses the factors utilized for performance evaluation in the past as well as the results of this study. The sub-factors that affect the main factors are identified, and evaluation criteria developed there from.

### 2.1. Performance evaluation

The performance evaluation is a systematic review process carried out to help an organization reach a certain goal. Making performance evaluation part of the management and control system helps the organization to effectively manage its resources and measure its performance in relation to its goals (Wu and Hung, 2008). Traditional evaluation metrics are most often based only on financial performance and are thus limited in their assessment of overall performance (Booth, 1996). The traditional evaluation of financial performance is not an effective or comprehensive measure, nor is it a holistic evaluation concept. Kaplan and Norton (1992) proposed the balanced scorecard approach in order to overcome these shortcomings.

### 2.2. Kaplan and Norton's balanced scorecard approach

The balanced scorecard approach takes into consideration the organization's vision and strategies, focusing on both financial and non-financial performance. In short, it monitors short-term financial performance while also highlighting the value of long-term financial metrics and competitiveness (Kaplan and Norton, 1992, 1996, 2001). According to Pinerio (2002) the balanced scorecard approach is aimed at helping the organization achieve its goals, while maintaining the traditional financial perspective to measure its tangible assets. It includes three perspectives (i.e., customers, internal processes, and learning and growth) to evaluate intangible assets and intellectual capital. Organizational strategies are examined from both financial and non-financial perspectives, based on actual data for a comprehensive evaluation.

### 2.3. Causal relationships in performance evaluation

Kaplan and Norton (2004) proposed "there is a causal relationship between the four perspectives of the balanced scorecard approach". If, financial results are the ultimate goal of any business enterprise, learning and growth serve as the foundation. The results from the financial metrics are lagging indicators, whereas the results from learning and growth, internal processes and customers are the leading indicators. Thus, financial performance can be improved by focusing on learning and growth, internal processes and customers (Kaplan and Norton, 2001). Kaplan and Norton (2004) suggest showing the interrelation between the four perspectives can be shown on a strategy map, since financial goals can be attained by making sure that the target customers are satisfied, it is imperative to identify areas of value creation for the customer, ways to generate sales and increase customer loyalty. Internal processes are an important aspect of value creation, and learning and growth is an important intangible component of this. Learning and growth is positively correlated to internal processes.

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