*American Journal of Tourism Research*
*Vol. 1, No. 1, 2012, 26-32*

# Using DEMATEL Method for Medical Tourism Development in Taiwan

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The main objective of this study is to find the strategy about how to develop the medical tourism in Taiwan. Tourism is a low-polluting industry. Many countries develop tourism industry actively. And the tourism pattern get diversify gradually. Combining tourism and medical services into medical tourism has been becoming a trend. This study discusses the development of medical tourism in Taiwan by DEMATEL. DEMATEL method can confirm interrelationships among diverse factors and identify the key factors. This study with the structure divided into five main aspects, including the strengthening of infrastructure and tourist services, the clarity of market segmentation, marketing planning, as well as government policy. The results show that the internet can provide detailed information on medical tourism and strengthen the marketing in order to develop medical tourism industry in Taiwan. From the results, it is suggest the government should to actively promote marketing and construct the web that can provide abundant information of medical tourism.

Keywords: medical tourism, Taiwan, DEMATEL

## Introduction

As society changes, tourism pattern has also been changing and diversifying. The new pattern of combining tourism industry and medical services into medical tourism will be one of the future trends in tourism development (Connell, 2006). Different from mass tourism, medical tourism reflects an extended, special tourist pattern that mainly promotes the concept of health care and tourism and weighs modern people's emphasis on disease prevention.

According to Huat's (2006) research, when tourists visit a particular place, they stay locally and participate in free time activities at their leisure; therefore, the development of medical tourism could bring considerable benefits to the countries, in addition to their medical services. The rise of medical tourism not only promotes the development of related industries, but also create diverse employment opportunities within hotel industry and health care, for example (Farrugia, 2006).

According to the estimation of World Health Organization (WHO), health care and surgical treatment industries will become the world's largest industries by 2022 while tourism will become the world's second largest industry. The combination of medical health care and tourism will account for 22% of the world's GDP (Bies & Zacharia, 2007). Since the medical treatments in developed European and American countries are expensive, more and more people are inclined to utilize medical services in foreign countries with advanced medical technologies (Connell, 2006). Therefore, medical tourism has enjoyed much attention in recent years, becoming a new popular industry that Asian countries actively develop. Owing to the huge business opportunities in medical tourism, Asian countries are eager to develop this industry.

The overall resources in Taiwan, such as the quality and price of health care, are currently highly competitive compared with neighboring Asian countries; therefore, Taiwan has a potential to develop medical tourism. However, the development of this industry in Taiwan lacks behind the neighboring countries; therefore, this study discusses the issue of how to develop medical tourism in Taiwan. Widely used in many fields (Chen, Lee, & Yang, 2011; Tsai, Chou, & Lai, 2010), DEMATEL can quantify relevant degrees and relationships between various elements in order to understand the relationship structure to solve the problem.

This study uses DEMATEL to explore the relationship between various elements of the medical tourism development in Taiwan and formulate development strategies.

## The Definition of Medical Tourism

The definition of medical tourism from the relevant literature on medical tourism is currently not clear; various definitions are shown in Table 1.

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Table 1. The definition of medical tourism.

| Researchers | Definition |
|---|---|
| Carrera and Bridges (2006) | Countries that plan to provide health care promote or restore personal health through medical intervention. |
| Connell (2006) | Patients go abroad for surgical medical treatment. |
| Atlas (2006) | Passengers leave the original residence for other countries and stay at least more than one day for disease treatment, health promotion (such as yoga, massage), beauty (plastic surgery) and fertility (fertility treatment). |
| Yap, Chen, and Nones (2008) | Patients travel abroad to receive medical treatment, which may be cosmetic surgery or some special treatment or periodic health examination. |

As mentioned above, medical tourism means that passengers travel to different countries and engage in medical activities designed to promote and maintain physical health, including health checks, massage or beauty treatments, or some other special treatments.

## Research Method

### *DEMATEL*

DEMATEL was developed in the belief that the appropriate use of scientific research methods could improve understanding of the specific problem. DEMATEL was applied to solve problems concerning decisions in order to clarify the essential features of the problems and help make countermeasures.

Tzeng, Chiang, and Li, (2007) and Liou, Tzeng, and Chang (2007) used the fundamentals of this method to transform the attributes of the application and evaluation into a non-independent multi-criteria evaluation of problems. DEMATEL then determines the interdependent and constraining relations based on the specific features of the subjects. In this way, it reflects the essential features and the evolving trend of the system.

*Calculation steps of DEMATEL*

Step 1: Generation of Average Matrix: Suppose, in a problem that composes $n$ criteria, binary relations and the strength of each relation are investigated. We can get $n\times n$ matrix $A_k$ from the $k^{th}$ expert's questionnaire. The $a_{ij(k)}$ represents the degree of influence of criterion $E_i$ to $E_j$, which then forms the influence matrix $A_k$. The pair-wise comparison scale designates five levels with the scores of 0,1,2,3 and 4 representing "No influence", "Low influence", "Middle influence", "High influence", and "Very High influence", respectively.

$$A_k = \begin{array}{c} \\ E_1 \\ \vdots \\ E_i \\ \vdots \\ E_n \end{array} \begin{array}{c} \begin{array}{ccccc} E_1 & \cdots & E_j & . & E_n \end{array} \\ \begin{bmatrix} 0 & \cdots & a_{1j(k)} & . & a_{1n(k)} \\ \vdots & & \vdots & & \vdots \\ a_{i1(k)} & \cdots & a_{ij(k)} & . & a_{in(k)} \\ \vdots & & \vdots & & \vdots \\ a_{n1(k)} & \cdots & a_{nj(k)} & . & 0 \end{bmatrix} \end{array}$$

Suppose $m$ is the number of experts consulted. The $n\times n$ average matrix $Z$ if found by averaging all the experts' scores: $z_{ij}=(a_{ij(1)}+ a_{ij(2)}+\ldots. a_{ij(k)} \ldots.+ a_{ij}(m))/m$ Then, we get the average matrix Z.

$$Z = \begin{bmatrix} 0 & \cdots & z_{1j} & \cdots & z_{1n} \\ \vdots & & \vdots & & \vdots \\ z_{i1} & \cdots & z_{ij} & \cdots & z_{in} \\ \vdots & & \vdots & & \vdots \\ z_{n1} & \cdots & z_{nj} & \cdots & 0 \end{bmatrix}$$

Step 2: Normalized initial direct-relation matrix
Let $S=max(\sum^{n}_{j=1}z_{ij}, \sum^{n}_{i=1}z_{ij})$, then divide the entire matrix $Z$ with $S$, to obtain the equation $X=Z/S$, that is, the normalized initial direct-relation matrix $X$.

Step 3: Total relation Matrix: Matrix $X$ indicates only direct relations. A continuous decrease of the indirect effects of problems along the powers of matrix $X$, e.g. $X^2,X^3,\ldots,X^\infty$, guarantees convergent solutions to the matrix inversion, similar to an absorbing Markov chain matrix (Li & Tzeng, 2009). The total relation matrix $T$ is an $n\times n$ matrix as follows:

$$T=\sum_{q=1}^{\infty}X^{i}=X+X^{2}+X^{3}+\cdots+X^{q}=\frac{X(I-X^{q})}{(I-X)}=\frac{X(I-X^{\infty})}{(I-X)}=\frac{X}{(I-X)}=X(I-X)^{-1}$$

($\lim_{q\to\infty}X^q=[0]_{n\times n}$, where $[0]_{n\times n}$ is the $n\times n$ null matrix, $I$ is the identity matrix)

Step 4: Prominence and Relevance: The ($i,j$) element of the matrix $T$, $t_{ij}$, denotes the full direct- and indirect-influence exerted from criterion $E_i$ to criterion $E_j$. Let $t_{ij}$ ($i,j=1,2,....,n$) be the elements of $T$, then the sums of all rows and columns are $D_i$ and $R_j$, respectively. $D_i=\sum^{n}_{j=1}t_{ij}$ $(i=1,2,...,n)$ $R_j=\sum^{n}_{i=1}t_{ij}$ $(j=1,2,...,n)$ $R_j$ is the total for j column, representing criterion $i$ as outcome reflecting the total that is being influenced by other criteria.

$D_i$ and $R_j$ values derived from direct/indirect relation matrix T embrace direct and indirect influence. ($D_k+R_k$) is defined as the prominence, while $k=i=j=1,2,...,n$ show the influence of criteria and total extent of being influenced. ($D+R$) is called prominence, which indicates the element's degree of influence and being influenced. ($D$-$R$) is called relation. If it is positive, the criterion tends to fall under the result category. If it is negative, the criterion tends to fall under the causal category.

Step 5: Set a threshold and draw the cause-effect diagram In order to explain the structural relationship among the criteria while keeping the complexity of system to a manageable level, it is necessary to set a threshold value to filter out the negligible effects in matrix $T$.

The threshold value can be chosen by the decision maker or through discussions with experts. If the value is too low, the diagram will be too complex to show the necessary information for decision-making. If it is too high, many criteria will be presented as independent criteria, without showing the relationships with other criteria. An appropriate threshold value is necessary to obtain a suitable cause-effect diagram as well as adequate information for decision-making (Li & Tzeng, 2009).

First, it is necessary to set ($D+R$) as the X-axis and ($D$-$R$) as the Y-axis. The cause-effect diagram can show the complicated causal relation, which can be analyzed and solved completely.

Step 6: Analysis matrix for total relations: The X-axis ($D+R$) indicates the sum of the criteria attribute that influences other criteria and the sum of the criteria attribute over which other criteria exert an influence.

The Y-axis ($D$-$R$) indicates the difference in the criteria attribute influencing other criteria and the difference in the criteria attribute over which other criteria exert an influence.

***MMDE***

The experts determined the threshold when applying DEMATEL in the past. Therefore, obtaining the threshold value is different for each researcher. The Maximum Mean De-Entropy Algorithm (MMDE) can get a uni threshold value. The steps of MMDE method are described as follows (Li & Tzeng, 2009):

Step 1: Transforming the $n\times n$ total relation matrix T into an ordered set $T$, $\{t_{11},t_{12},...,t_{21},t_{22},...,t_{nn}\}$, rearranging the element order in set $T$ from large to small, and transforming to a corresponding set of ordered triplets ($t_{ij},v_i,v_j$) denotes $T^*$. Each element of set $T$, $t_{ij}$, can also be seen as the ordered triplets ($t_{ij},v_i,v_j$ denoting influence value, dispatch-node, receive-node, respectively) that denote $T^*$.

Step 2: Taking the second element as the dispatch-node from the ordered triplets of the set $T^*$, then obtaining a new ordered dispatch-node set, $T^{Di}$.

Step 3: Taking the first t elements of $T^{Di}$ as a new set $T_t^{Di}$, assigning the probability of different elements, and then calculating the $H^D$ of the set $T_t^{Di}$, $H_t^{Di}$ allows us to calculate the mean de-entropy using eq. $MDE_t^{Di}=H_t^{Di}/N(T_t^{Di})$.

Step 4: Considering the mean de-entropy values ($T_t^{Di}$), we choose the maximum mean de-entropy and its corresponding $T_t^{Di}$. This dispatch-node set, with the maximum mean de-entropy, is denoted as $T_{max}{}^{Di}$.

Step 5: Similar to Steps 2-4, an ordered receive-node set $T^{Re}$ and a maximum mean de-entropy receive-node set $T_{max}{}^{Re}$ can be determined. The elements of $T_{max}{}^{Re}$ provide information that is easily influenced.

Step 6: Taking the first $u$ elements in $T^*$ as the subset, $T^{Th}$, which includes all elements of $T_{max}{}^{Di}$ in the dispatch-node and all elements of $T_{max}{}^{Re}$ in the receive-node, the minimum influence value in $T^{Th}$ is the threshold value.

***Study framework***

In terms of medical tourism development in Taiwan, this study first identified national development experience from the literature and summed up the preliminary criteria for developing this industry in Taiwan.

Subsequently, the principal investigators discussed these criteria with four professors with expertise in tourism and identified 11 points divided into five main categories, namely, the strengthening of infrastructure, and the strengthening tourist services, the clarity of market segmentation, marketing planning, and government policy. Table 2 presents each point.

Table 2. Study framework.

| Cluster | Criteria | Explanation |
|---|---|---|
| A. The strengthening of infrastructure | a1. The infrastructure of medical institutions | Strengthening the infrastructure of medical tourism, hospitals, and related facilities |
| | a2. Transportation Convenience | Building mass transit systems linked with health care institutions |
| B. The strengthening of tourist services | b1. The international tour guide | Training the guides with the knowledge of medical industry |
| | b2. internet information | Building official website and introducing the information on medical leisure and tourism |
| | b3. Medical consultation centers | Establishing the service centers that provide medical consultation |
| C. The clarity of market segmentation | c1. Development of major markets | Actively developing target markets |
| | c2. The competitiveness of products | Introducing competitive products assortment of medical tourism |
| D. Marketing planning | d1. Itinerary planning and packaging | Incorporating tourist resources, such as city tour |
| | d2. Internet marketing | Enhancing marketing through the power of the internet media |
| E. Government policy | e1. Health care policies | Deregulating health care policies |
| | e2. Tourism policy | Opening tourism policy, such as visa free, VISA ON ARRIVAL, or other incentives |

## Results

The study included 11 criteria and used DEMATEL to divide the questionnaire into five levels. The study releases DEMATEL expert questionnaires, distributing 15 questionnaires targeting tourists and physicians with atleast10-yearexperience and identifies the relationship between criteria. The distribution of 15 questionnaires is suitable, as group decision-making is more appropriate with 5 to 15 questionnaires (Teng, 2002).

### *Initial direct-relation*

The experts were asked to indicate influence of each relationship among the criteria using questionnaire. By calculating the arithmetic average of experts' response to summarize experts' opinions, we finish Table 3. On calculation the sum of rows and columns separately, 24.6 is the largest of sum.

Table 3. Average Matrix Z.

| | a1 | a2 | b1 | b2 | b3 | c1 | c2 | d1 | d2 | e1 e1 | e2 | $\Sigma z_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a1 | 0.0 | 2.4 | 2.4 | 1.6 | 2.4 | 2.8 | 1.6 | 2.6 | 1.6 | 2.4 | 2.8 | 22.6 |
| a2 | 2.2 | 0.0 | 2.8 | 1.6 | 2.4 | 2.8 | 1.8 | 3.0 | 1.8 | 1.6 | 2.8 | 22.8 |
| b1 | 2.0 | 2.4 | 0.0 | 1.8 | 2.0 | 2.2 | 1.4 | 3.0 | 1.4 | 1.4 | 2.2 | 19.8 |
| b2 | 2.0 | 2.6 | 2.6 | 0.0 | 2.4 | 2.4 | 2.4 | 2.8 | 3.0 | 1.6 | 2.8 | 24.6* |
| b3 | 1.8 | 1.8 | 1.8 | 2.4 | 0.0 | 1.2 | 0.6 | 1.2 | 1.8 | 2.8 | 1.8 | 17.2 |
| c1 | 1.8 | 2.2 | 2.2 | 2.0 | 1.8 | 0.0 | 2.8 | 2.4 | 2.4 | 1.8 | 2.4 | 21.8 |
| c2 | 1.0 | 1.2 | 2.0 | 1.4 | 1.4 | 2.4 | 0.0 | 2.4 | 3.0 | 1.2 | 2.0 | 18.0 |
| d1 | 2.4 | 2.2 | 1.8 | 2.2 | 1.6 | 2.6 | 2.4 | 0.0 | 2.4 | 1.8 | 2.6 | 22.0 |
| d2 | 1.8 | 2.2 | 2.4 | 2.8 | 2.4 | 2.4 | 3.0 | 2.4 | 0.0 | 1.2 | 2.8 | 23.4 |
| e1 | 1.2 | 1.6 | 1.8 | 1.4 | 2.0 | 1.8 | 1.2 | 1.6 | 1.2 | 0.0 | 1.8 | 15.6 |
| e2 | 2.0 | 2.4 | 2.8 | 2.0 | 1.6 | 2.4 | 1.6 | 2.2 | 2.2 | 1.6 | 0.0 | 20.8 |
| $\Sigma z_j$ | 18.2 | 21.0 | 22.6 | 19.2 | 20.0 | 23.0 | 18.8 | 23.6 | 20.8 | 17.4 | 24.0 | |

Note: Bold value: S=24.6.

***Normalized initial direct-relation***

The normalized initial direct relation matrix X is obtained by dividing the direct relationship matrix in Table 3 by the S = 24.6 (Table 4).

Table 4 Normalized initial direct-relation matrix X.

| | a1 | a2 | b1 | b2 | b3 | c1 | c2 | d1 | d2 | e1 | e2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| a1 | 0.0000 | 0.0976 | 0.0976 | 0.0650 | 0.0976 | 0.1138 | 0.0650 | 0.1057 | 0.0650 | 0.0976 | 0.1138 |
| a2 | 0.0894 | 0.0000 | 0.1138 | 0.0650 | 0.0976 | 0.1138 | 0.0732 | 0.1220 | 0.0732 | 0.0650 | 0.1138 |
| b1 | 0.0813 | 0.0976 | 0.0000 | 0.0732 | 0.0813 | 0.0894 | 0.0569 | 0.1220 | 0.0569 | 0.0569 | 0.0894 |
| b2 | 0.0813 | 0.1057 | 0.1057 | 0.0000 | 0.0976 | 0.0976 | 0.0976 | 0.1138 | 0.1220 | 0.0650 | 0.1138 |
| b3 | 0.0732 | 0.0732 | 0.0732 | 0.0976 | 0.0000 | 0.0488 | 0.0244 | 0.0488 | 0.0732 | 0.1138 | 0.0732 |
| c1 | 0.0732 | 0.0894 | 0.0894 | 0.0813 | 0.0732 | 0.0000 | 0.1138 | 0.0976 | 0.0976 | 0.0732 | 0.0976 |
| c2 | 0.0407 | 0.0488 | 0.0813 | 0.0569 | 0.0569 | 0.0976 | 0.0000 | 0.0976 | 0.1220 | 0.0488 | 0.0813 |
| d1 | 0.0976 | 0.0894 | 0.0732 | 0.0894 | 0.0650 | 0.1057 | 0.0976 | 0.0000 | 0.0976 | 0.0732 | 0.1057 |
| d2 | 0.0732 | 0.0894 | 0.0976 | 0.1138 | 0.0976 | 0.0976 | 0.1220 | 0.0976 | 0.0000 | 0.0488 | 0.1138 |
| e1 | 0.0488 | 0.0650 | 0.0732 | 0.0569 | 0.0813 | 0.0732 | 0.0488 | 0.0650 | 0.0488 | 0.0000 | 0.0732 |
| e2 | 0.0813 | 0.0976 | 0.1138 | 0.0813 | 0.0650 | 0.0976 | 0.0650 | 0.0894 | 0.0894 | 0.0650 | 0.0000 |

***The total relation***

By dividing the normalized initial direct relation matrix in Table 4 by formula $T=X(I-X)^{-1}$ we can get the total relation matrix *T* (Table 5). Then we calculate the sum of various rows and columns to obtain *D* and *R* values. The threshold value was 0.6483 by using MMDE. Values higher than the threshold value are presented in bold, for example, the fourth column and the sixth row in Table 5 is 0.6507, which means that b2 will affect c1.

Table 5 The total relation Matrix T.

| | a1 | a2 | b1 | b2 | b3 | c1 | c2 | d1 | d2 | e1 | e2 | *D* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a1 | 0.4171 | 0.5625 | 0.5930 | 0.4967 | 0.5349 | 0.6148 | 0.4882 | 0.6205 | 0.5272 | 0.4830 | 0.6346 | *5.9727* |
| a2 | 0.5061 | 0.4810 | 0.6142 | 0.5039 | 0.5411 | 0.6229 | 0.5026 | 0.6429 | 0.5420 | 0.4604 | 0.6430 | *6.0600* |
| b1 | 0.4505 | 0.5143 | 0.4522 | 0.4590 | 0.4752 | 0.5425 | 0.4385 | 0.5813 | 0.4734 | 0.4071 | 0.5604 | *5.3545* |
| b2 | 0.5319 | 0.6143 | **0.6483*** | 0.4783 | 0.5775 | **0.6507*** | 0.5594 | **0.6786*** | 0.6222 | 0.4902 | **0.6863*** | *6.5377* |
| b3 | 0.3924 | 0.4374 | 0.4611 | 0.4281 | 0.3494 | 0.4453 | 0.3573 | 0.4556 | 0.4293 | 0.4101 | 0.4826 | *4.6485* |
| c1 | 0.4733 | 0.5423 | 0.5732 | 0.4994 | 0.5022 | 0.4999 | 0.5214 | 0.6014 | 0.5456 | 0.4490 | 0.6077 | *5.8153* |
| c2 | 0.3826 | 0.4364 | 0.4894 | 0.4145 | 0.4202 | 0.5107 | 0.3561 | 0.5214 | 0.4959 | 0.3676 | 0.5134 | *4.9082* |
| d1 | 0.5004 | 0.5500 | 0.5675 | 0.5126 | 0.5024 | 0.6037 | 0.5145 | 0.5203 | 0.5523 | 0.4554 | 0.6230 | *5.9021* |
| d2 | 0.5033 | 0.5764 | 0.6162 | 0.5584 | 0.5544 | 0.6247 | 0.5584 | 0.6387 | 0.4912 | 0.4564 | **0.6591*** | *6.2369* |
| e1 | 0.3418 | 0.3959 | 0.4245 | 0.3623 | 0.3908 | 0.4297 | 0.3485 | 0.4320 | 0.3768 | 0.2786 | 0.4441 | *4.2252* |
| e2 | 0.4677 | 0.5349 | 0.5773 | 0.4848 | 0.4813 | 0.5717 | 0.4650 | 0.5779 | 0.5209 | 0.4295 | 0.5015 | *5.6126* |
| *R* | *4.9669* | *5.6453* | *6.0169* | *5.1980* | *5.3294* | *6.1165* | *5.1100* | *6.2708* | *5.5767* | *4.6873* | *6.3559* | |

* Indicates it is larger than the threshold value 0.6483.

### *The prominence and relevance*

To calculate ($D+R$) and ($D-R$), the $D$ value and $R$ value are rearrange in the relationship matrix of the total criterion effect (direct / indirect) in Table 4 according to the order of each criterion like Table 6.

Table 6 Causal influence level summarized table of criteria.

| | D | R | D+R | D-R |
|---|---|---|---|---|
| a1 | 5.9727 | 4.9669 | 10.9396 | 1.0057 |
| a2 | 6.0600 | 5.6453 | 11.7053 | 0.4146 |
| b1 | 5.3545 | 6.0169 | 11.3714 | -0.6624 |
| b2 | 6.5377 | 5.1980 | 11.7358 | 1.3397 |
| b3 | 4.6485 | 5.3294 | 9.9779 | -0.6809 |
| c1 | 5.8153 | 6.1165 | 11.9318 | -0.3011 |
| c2 | 4.9082 | 5.1100 | 10.0182 | -0.2018 |
| d1 | 5.9021 | 6.2708 | 12.1728 | -0.3687 |
| d2 | 6.2369 | 5.5767 | 11.8136 | 0.6602 |
| e1 | 4.2252 | 4.6873 | 8.9124 | -0.4621 |
| e2 | 5.6126 | 6.3559 | 11.9685 | -0.7432 |

At last, the relationship diagram (Figure 1) is draw by plotting the coordinate values of each criterion into a scatter plot with the horizontal axis ($D+R$) and the vertical axis ($D-R$). In figure 1, the lines with arrows use to indicate the direction of the relationship of criteria that have matrix values higher than the threshold value.

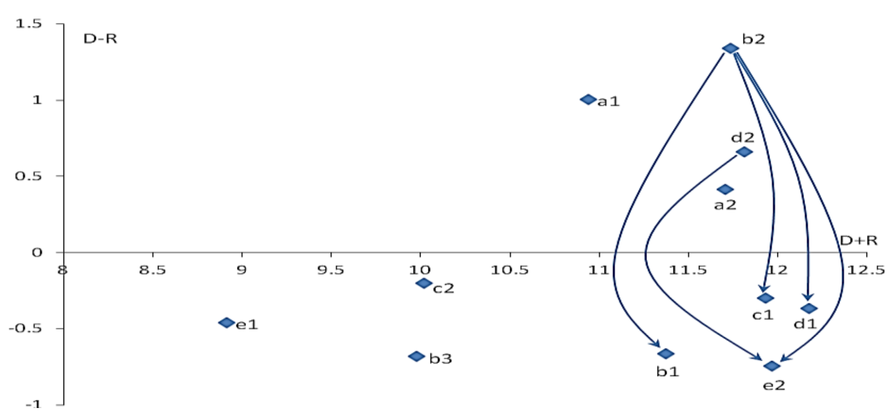


Figure 1. Causality diagram of criteria.

**Discussions**

The total relation matrix includes direct and indirect effects. $(D+R)_i$ provides an index of strength of influences gives and received, that is, $(D+R)_i$ shows the degree that the factor $i$ plays in the problem. The more positive the $D+R$ is, the greater is the degree of influence on other factors. If $(D-R)_i$ is positive , then factor I is affecting other factors, and if $(D-R)i$ is negative, then factor I is being influenced by other factors.This study used 11 criteria. The three items representing ($D+R$) correlation are "d1 itinerary planning and packaging", "b2 network information", and "d2 internet marketing".

This indicates that these three factors are of great importance in total assessment of criteria associated with the development of medical tourism, which indicates that it is important to plan abundant, safe, and attractive itinerary, combines with the surrounding tourism resources, such as city tour and tourism image shaping, to develop the medical tourism in Taiwan. As for the effect degree of ($D-R$), the former three items with positive value are "b2 network information", "a1 existing infrastructure", and "d2 Internet Marketing", showing that these three criteria can directly influence other factors. Moreover, easy access to the information on medical leisure travel, rich network information, as well as clear conveyance is helpful to develop medical tourism in Taiwan. Taking the (*D+R*) and (*D-R*) combination into account, it was discovered that the key criteria for higher critical degree and positive and higher influence degree are "b2 network information" and "d2 internet marketing". Therefore, the Internet can use to undertake promotion and to provide rich information on medical tourism in terms of the development strategy.

## Conclusion

This study discusses the strategy for the development of medical tourism in Taiwan through DEMATEL. It can be seen from the literature that countries with well-developed medical tourism must be provided with high quality medical services as well as the government support for effective development. At present, medical services in Taiwan have substantial quality, and the government has gradually attached importance to this industry. Consequently, from the study results, experts suggest that Taiwan should actively promote marketing, make good use of network resources to provide comprehensive information on medical tourism due to the advanced global Internet, and actively undertake marketing to foreign countries so that Taiwan's medical tourism industry can boom.

Research on medical tourism in Taiwan is currently inadequate, and this study is only preliminary. In-depth discussion and further research on individual factor can perfect the overall study; thereby, stimulate further development of medical tourism industry in Taiwan. Comparing to other industries, tourism industry is friendly to the environment. So many countries develop its tourism industry actively. Medical tourism is one of the popular develop directions. It can not only enhance the tourism output value, but also led to advances in medical industry. Although this study only explores Taiwan's development in medical tourism, the results also provide a great reference value to other countries interested in developing medical tourism.

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